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AMERICAN INDUSTRIES REQUIRE A PROTECTIVE TARIFF.

The government of the United States requires for its support an annual expenditure of about $800,000,000, an increase within the last eight years of 33 1-3 per cent., greatly exceeding the percentage of increase in the population which was little more than thirteen. This increase has been chiefly due to the payments made on account of the Panama canal, the navy, the post office, and the requirements of the interior department, mainly for pensions. Nearly 40 per cent. of the income necessary for this expenditure is derived from customs revenue, 30 per cent. from the internal revenue on spirits, liquors, tobacco, etc., and 30 per cent. from the postal service and miscellaneous sources. It is thus seen that the national government depends chiefly for its means for carrying on its multifarious objects, on its receipts from customs dues on imports, and for this purpose the people of the country are taxed a little less than $4.00 per capita—$3.86 in 1907.

It has been the political policy of the United States to derive its principal means of support from the taxes imposed on foreign articles imported at its ports, but so prescribed as to be the least felt, and protective to its domestic, especially manufacturing, industries without being onerous on the great mass of consumers, whose interests and benefits are guarded by the home competition that is thereby induced. These interests are consulted in the framing of the tariff laws, in that about 50 per cent. of what merchandise is imported is permitted to come in free of duty, made up largely of food stuffs in a crude condition, and crude materials used in manufacturing. Exceptional in this latter feature is the duty on wool, and to this extent is more a tax on the manufacture than on the people, though the latter is obliged to bear a portion of it.

Taxation, as it may appear in the receipts from customs on foreign imports, is consequently the most vital question in revenue legislation that can possibly come before the representatives of the people in congress. It is upon its potency that the government is enabled to carry to a finality the projects that are inaugurated to develop the resources and stimulate the ambitions of the nation. While the tariff and other methods of raising revenue should be freed from all partisan bias or incitement, the advocacy of anything of this kind is more sentimental than practical, as partisanship in the political division of the people is almost wholly upon economic questions affecting the commercial and industrial welfare of the nation, more or less influenced by local considerations of immediate or collateral significance. It can not be dissociated from party platforms, and when a non-partisan commission is suggested, it is something that is not feasible, and, therefore, is a theoretical conception, more or less utopian. This is observed in the make-up of the U. S. Supreme Court judiciary, and the Board of U. S. General Appraisers. The tariff on imports is a political question that has never been nor can it be taken out of party politics, any more than it can be severed

from the national constitution as a vital element of its effectiveness in the conduct of governmental functions.

Both of the great political parties of the country have announced in their national platforms in favor of the principles of protection to the industrial energies of the nation as manifested in its manufactures and commercial enterprises, but they differ in the methods and extent to which they should be carried. They both believe that the law that now prevails, and has been in active operation for the last eleven years or more, should be revised so as to meet existing industrial conditions, but they diverge upon the nature of the revision as applicable to specific industries. There is, therefore, no difference of opinion on the mere fact that there should be a revision, but there is a variance in what the revision shall consist of, except so far that it shall not be upward as affecting the rates of duty as a broad proposition. Revision may mean readjustment, and this is the view that is now being taken by the majority members in congress as represented in the house committee on ways and means that is now at work on the various schedules.

Protection to domestic industries is the key-note of any revision that may be decided upon, but the difficulty centers on fixing upon this note, which is no more nor less than the difference in the cost of production between the foreign and domestic article affected. As a broad declaration there is no controversy over the fact that this cost is greater in the United States than in competing foreign countries, yet there are exceptions, and some of these may be found in the iron and steel industries, but no intimation has been broached that they affect any of the textile branches. The chief element in the cost of production, of course, is in that of labor, affected by the relative skill and ability directly displayed therein, and by the processes and methods employed. But in addition thereto, there are other elements that must be taken account of, as the accumulation of labor cost in the materials employed, contributory to the success of any particular industry, requiring larger capitalization and heavier operating expenses. Besides all this, a margin of protection must be allowed, as a matter of business experience and prudence, for a probable shifting of this relative cost, up or down, for undervaluation, and for depreciation in foreign values during periods of industrial depression. These are the crucial elements that must enter into any calculations for determining the proper rates of duty, and they are not easily ascertained. They are the most intricate problems to be contended with in tariff legislation. The difference in cost should be no more than the lowest cost abroad, under the most favorable circumstances, and the highest in this country, under skilful management with the best equipment for economical production. The laws of the country should never be such as to furnish protection to unskilfulness and mismanagement, and to inadequate means of production, or encourage such.

The most available source of information for practical and concrete data is that obtainable in the archives and decisions of the Board of U. S. General Appraisers, which may truly be denominated a board of experts of as pronounced a kind as can possibly be conferred on a commission specially appointed and organized to consider questions relating to a tariff on imports. In a very considerable measure, this board has already contributed to a material extent to the formation of a new tariff out of the one now in force, by its interpretations of the provisions contained therein. This board has devoted years to the study of the law in its various ramifications and legal status as expressive of the intent of the congress enacting it as an instrument for the protection of our industries. This board is familiar, from every practical standpoint, with foreign market values of imported articles, and in every other respect as fully, if not better, qualified to pass judgment and advice as any special commission that can be instituted. In this board congress has at its command the labors and opinions of an expert commission all ready at hand.

TARIFF ON WOOL AND ITS MANUFACTURE.

No part of the customs tariff has elicited more attention and study than that relating to wool and its manufactured products to the extent that it shall be adequately protective to the branches involved, and at the same time not disturb the proper equilibrium between them.

A POLICY OF ACQUIESCENCE.

The wool and woolen schedule, as it now appears in the tariff laws, had its initiative in the wool and woolen act of 1867, and no departure has since been made in the principles then inaugurated, and what changes have been made were simply for the purpose of equalizing conditions that might exist between the wool growing and wool manufacturing interests. The relations between these two interests have always been more or less antagonistic, but perhaps no more so than naturally exist between those that usually are expected between producer and consumer, or seller and buyer. The adjustments that have been made in the several acts have been the results of compromises, oftentimes after acrimonious discussions long drawn out. Of late years, however, the policy that has actuated the relative positions taken by wool growers and manufacturers has been one of acquiescence, especially on the part of the latter, who have practically stood aloof in controlling the rates of duty on the raw material, and thus have left this matter almost entirely to the wishes and devices of the growers. This has been found to work satisfactorily, so far as maintaining a friendly feeling between those concerned for the purpose of reciprocal assistance in securing desired tariff legislation. There is, therefore, a feeling of mutual dependency between the wool grower and the manufacturer in obtaining the necessary votes in congress to carry through any measure desired by either.

It may almost be said that there has always been a kind of armed truce existing between the grower and manufacturer of wool, and the main, if not only, reason for their pulling together is the mutual aid that is derived therefrom and thought necessary to accomplish the political end of full tariff protection against foreign importations that might compete with domestic production. The political necessity of this mutuality is not at all uncommon between allied interests and cannot be a subject for adverse criticism considering the complexion of congress and the diverse influences affecting legislation therein. The give and take policy seems to be the only feasible one upon which ends can be attained.

MANUFACTURERS HAVE NOT INITIATED DUTY ON WOOL.

There are manufacturers who conscientiously and by habit believe in a tariff on the raw material as well as on the manufactured product, but the large majority would

be better satisfied with the free importation of the commodity were it not for the apprehension that, were this so, they would, at least, fail in securing the necessary support in congress to carry through their own projects for tariff protection. This, however, may be more of an apprehension than facts might warrant were they allowed to present themselves. This fact, however, should be borne in mind, that manufacturers as a body, or in any conspicuous instance, during the whole history of tariff legislation within the last third of a century, have not, of their own initiative, asked for a duty on wool imports, but there are instances when they have objected to it, either as obnoxious in form or inconsistent with the best interests of their industry. Even as long ago as the time of the tariff agitation of 1866, which led to the enactment of the 1867 law, the National Association of Wool Manufacturers, through its then secretary, opposed the demands of wool growers for rates of duty that seemed to it as being not only excessive, but detrimental, to the woolen industry. Yet the necessity of a duty on wool was much more imperative at that time than it is to-day because of the peculiar nature of sheep husbandry, which was given almost exclusively to the production of wool, and only incidentally to that of mutton. This condition is now almost reversed, and wool is secondary to the production of mutton, which latter is protected by a duty of two cents a pound, that has proven sufficiently protective as shown by the small quantity imported for consumption, amounting, for example, in 1907, to only 368,452 pounds.

NECESSITY OF DUTY ON MERINO WOOL.

The necessity of a protective duty on the merino sheep industry from which the fine wools for the higher quality of goods are obtained, may be admitted, as the remunerative production is the wool itself rather than the meat, and foreign competition is much keener and more active in the former than in the latter. To this extent, therefore, the fine, or merino, wool production of West Virginia and Ohio should have the benefit of a tariff protection against the fine wools of Australia, in particular, if this domestic industry is expected to be self sustaining, which, however, is handicapped by extraordinary expenses, among them may be noted the value of land and pasturage, such as the ranges of our western territory and those of Australia and Argentina are not subject to. It may be a question whether our wool manufacturing industry should be taxed to such an extent as to cover these expenses that are not understood as legitimately belonging to a range sheep, to which the merino belongs.

The mutton sheep is not a range sheep and cannot be made one. It belongs to the farm or small landholdings as is the case in Great Britain and in the continental countries of Europe. It is an economical adjunct of agricultural pursuits, and readily lends itself to such, and thus considered requires little or no protection as a necessity to its existence.

If the wool grower is to have protection, and it is only the merino product that needs it, it should be adequate and no more so. The present specific duty of eleven cents a pound is not nearly so protective to-day, within 40 to 50 per cent., as it was in 1897 when the present tariff was enacted, due to the higher price now than then. We do not expect to see any change in the prospective revision of the tariff from the specific to an ad valorem rate of duty. The rule, in this respect, that has characterized the imposition of duty on this material will unquestionably be followed as has been the practice for more than a generation. The relative advisability of specific and ad valorem duties has been so frequently discussed that it seems irrelevant to pursue it at this time.

AN AD VALOREM RATE OF DUTY.

However, in theory, the ad valorem rate may appear to be the most equitable, its alleged weakness in practice has deterred its acceptance in any tariff legislation. The science of tariff legislation seldom runs along scientific lines, but along those that have been demonstrated to be the most practical under prevailing trade methods and occasional chicanery, especially those that relate to undervaluation, the great bugaboo in customs administration. We say bugaboo because we believe that the spectre of undervaluation that is associated with an ad valorem duty on wool is not entitled to the prominent consideration that is given to it in contrast with any advantage that a specific duty may possess. An ad valorem duty, of course, depends on the value of the commodity, and it seems unreasonable to suppose that the value upon which the duty would be imposed would be more difficult to ascertain through trade and commercial agencies than the blood of the wool upon which the specific duty is now based. In fact, more expert discrimination is required to determine blood characteristics than the commercial value of the article.

The specific duty on wool furnishes the excuse for the specific duty on its manufactures, in addition to the ad valorem duty on the latter. The specific duty on goods is thus placed to compensate the manufacturer for the duty he is obliged to pay on his imported raw material and consequently enhanced value of that of domestic growth. The ad valorem duty that is put on the competing goods that are imported is his assumed protection against foreign aggression. For this purpose, this duty is accepted as sufficiently protective, but as a matter of acknowledged fact the specific duty is more than compensatory, and, in reality, furnishes additional protection of a pronounced value. It is largely for this reason why manufacturers are apparently indifferent to what the duty may be on his raw material, as he gets an augmented benefit therefrom due to the structural features upon which the rates of duty are calculated and established. That is, the manufacturer gets a specific, or compensatory, protection on his goods of four times the duty he is obliged to pay on his foreign wool on the assumption that it takes four pounds of wool in the grease to make one pound of cloth, when, as a matter of fact, no such thing is the case in actual practice simply because the manufacturer selects in his foreign purchases a lighter shrinking wool than that which will yield him only one pound out of four pounds in the grease. But, it should be said, this forced selection compels him to pay a relatively higher price for what he does purchase, and to this extent he is at a disadvantage in foreign markets.

Our allusions, it may be noted, are to wools of the merino blood, which are the ones chiefly imported for our manufactures. This, however, is but one, and the most favorable, feature pertaining to the protection furnished wool manufactures. The several features affecting the relations between the tariff on wool and its manufacture are so complex, yet logical, that it would take more space than we can spare at this time to attempt their elucidation. We

can simply say that whatever advantage the manufacturer may derive from the compensatory duty on imports of competing fabrics, of four times the duty on the raw material, as now in vogue, his disadvantage would be quickly in evidence were this relation lowered.

A TARIFF ON COTTON.

The Sea Island cotton growers have, through their official organization, appeared before the committee on ways and means of the house of representatives, Washington, D. C., appealing for a "speedy enactment of an amendment to the present tariff laws by which an import duty of not less than 40 per cent. shall hereafter be imposed on the market valuation of all foreign raw cotton imported to America, which can be used as a substitute or competitor by American mills against similar grades raised in this country."

The petition, as formally presented, points out that "the heavy and constantly increasing annual importations of Egyptian raw cotton into this country by American manufactures is becoming a serious menace to the production of such grades of cotton in this country. In 1907 the importations of Egyptian long staple cotton was 90,000 bales, which was 10,000 bales in excess of the total production of Sea Island cotton in the States of Georgia and Florida for the same period. These importations are constantly on the increase and seriously affect the price of not only the Sea Island productions of Georgia, Florida and South Carolina, but between 300,000 and 500,000 bales of long staple cotton annually produced in the Mississippi Delta and territories adjacent thereto.

"It is altogether unfair to give high protection to American manufacturers against the shipment of manufactured cotton goods from abroad into this country duty free. American mills under this process are protected against competition from foreign mills, while they are given the power to regulate the price of Sea Island and long staple cotton raised in this country by the importation of Egyptian varieties of raw cotton duty free. Under this system the highly civilized and progressive American farmer is made to compete with the practically enslaved peasantry of Egypt. We do not believe that these conditions represent the true policy of the American Government. Either the protective duties favoring American manufactured cotton goods should be wiped out entirely and the American mill owners placed on a parity of competition with American cotton growers, or a duty of, at least, 40 per cent. of the market value of all grades of Egyptian and other foreign grown cotton should be levied against the importations of such cottons into this country. There are many mills in America to-day which are using only Egyptian cotton which they receive at their mills duty free, while the finished product of their mills is protected by a duty of from 40 to 60 per cent. against the competition of similar products manufactured abroad.

"The Southern cotton growers of these varieties are asking for a fixed duty of ten cents per pound on all grades of Egyptian cotton shipped into this country. Such a duty would at once mean an increased demand for long staple varieties in this country by American mills, and would stimulate production of these varieties, especially in the Delta of the Mississippi, where competition with Egyptian cofton under existing conditions is not profitable."

It is safe to say that any petition of this kind will be of no avail to those who have presented it, and purely so on economic grounds. If it has any logical standing it is because there should be no discrimination between raw materials for purposes of manufacture for tariff protection, as, for example, if the wool growers are entitled to protection against foreign competition, why should not cotton growers be equally favored? In answer, it may be stated that the positions of the two interests are not identical, and, moreover, are contrary in the one vital and controlling factor that wool is a non-exporting article and cotton is an exporting one, and just so long as this or any other product depends upon a foreign as well as a domestic market for its disposition its price will be governed by that prevailing where its value is the least, and if this exists in foreign marts it matters little what the domestic ones may be. This is a simple axiom in political economy and requires no great acumen on the part of any one to see it.

It is not a part of the tariff policy of this country to impose an import tax on raw material that is employed in our manufactures. The only conspicuous exceptions are wool, tobacco, cattle hides, flax and iron ore, and the latter may be relegated to the free list in the forthcoming revision of the tariff. None of these is an article of export.

AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

AT RICHMOND, VA., MAY 25-26.

At a meeting held in Charlotte, N. C., last month of the board of governors of the American Cotton Manufacturers' Association it was decided to hold the next annual convention in Richmond, Va., on May 25-26, instead of New York, which city had been previously selected, and the date of the annual meeting was changed from the third Wednesday in May to the fourth Tuesday in the same month. The meeting was mostly taken up with tariff matters. It was decided by resolution that the president be authorized to join in a call with various other organizations for a meeting to be held in Indianapolis some time during February to discuss the tariff question. The effort of the Agricultural Department to standardize the grades of cotton was also indorsed by resolution.

EMPLOYMENT OF CHILDREN IN SOUTH CAROLINA.

At the semi-annual convention of the South Carolina Cotton Manufacturers' Association, held last month in Charleston, S. C., at which 39 cotton mills were represented, a resolution was adopted approving the enactment by the State Legislature of a child labor law, limiting the age of employment of children in mills to 14 years of age, provided a compulsory education act be included in such a measure.

The home looms in France, are two or three in number and sometimes four, but the latter number is rare. All these are run by electric motor power. The hand loom is almost obsolete, and motor power is being extended to most of the surrounding towns and villages. The weavers work on the piece system, the price being fixed between the employers, who furnish the material, and the heads of the family.

Cold Spring Bleaching and Finishing Works, Yardley, Pa.

The plant of the Cold Springs Bleaching & Finishing Works, Yardley, Pa., is situated near the line of the Philadelphia and Reading Railroad, and was built in the summer of 1900 for the purpose of bleaching and finishing cotton goods. The location is an ideal one, communication between this point and either New York or Philadelphia is frequent and rapid; the distance from Philadelphia is thirty miles and from New York sixty miles. Yardley being in the direct line of communication from the South to New York, rail shipments from Southern mills to that point can be stopped en route without loss of time and at the least possible expense.

The building and arrangement of machinery and other equipment were designed by Lockwood, Greene & Company, mill engineers, Boston, Mass., and the construction was carried out in accordance with plans prepared by them.

Since its completion the plant has established for itself a name and reputation in its special line unsurpassed by any other plant in this country for square dealings and honesty of purpose which has never been questioned by any one in the trade. For ability to do the work which it has received from time to time, it has always measured up to the size of its responsibility, and there is no place in the country where goods can be sent under a larger surety that they will be returned in a satisfactory condition in every way.

Goods can be sent, not only with absolute confidence that they will be finished according to sample, but that they will be finished promptly and will be held in greatest security, insured if need be, and that deliveries from sales made by owners, wherever these sales may be, will be filled with the same accuracy and confidence in a perfect product as could be obtained from the absolute ownership of a bleachery by any of the parties concerned.

During the year 1903, the facilities proved totally inadequate to meet the wants of the customers of the works. Accordingly, additions were commenced resulting in more than doubling the capacity of the plant. The construction of the building permitted the use of unusually large windows admitting a flood of light upon every operation. In addition to large windows in the boiler and engine rooms, monitor skylights are provided for the sake of ventilation, and the ventilation in the main work rooms is obtained by arranging the large toplights of all windows to swing so that at least one-third of the large window opening is available at all times for the admission of air. The walls and ceilings are white, and the floors are of white maple, secret nailed to insure smooth surface. Local stone was used for the walls of the building and the interior is of heavy slow-burning mill construction, the beams and columns as well as plank being of long-leaf hard pine, all of ample size to sustain the loads and to resist the action of fires to as great an extent as possible.

HEMMING ROOM.

The organization of the works is complete each and every department being in charge of experienced men insuring that excellence of finish which is so necessary to the high standing of any concern whose goods are placed upon the market. In the matter of equipment the works are up-to-date, having all of the machinery that is necessary or desirable to turn out the most finished product.

Nothing contributes to the success of a bleachery plant to a larger extent, other things being properly developed, than the possession of a quantity of pure sweet spring water, and this, this bleachery has, and the ability to obtain

this water decided the location of the plant. Not a suggestion of iron can be found in the water, it is as nearly pure as can be found anywhere. This, in a large measure, accounts for the pure white products that are sent out by this establishment, and the uniformity of color. It is this remarkable characteristic of the bleachery that gives it its special significance in the eyes of those who desire specially finished fine white products. It is this particular feature that has in a large measure contributed to the continued growth of the plant. Every year since its creation has been recognized by the addition to the buildings and to the facilities in every way, widening its opportunities for work and increasing its output.

STARCHING ROOM, COLD SPRING BLEACHING AND FINISHING WORKS.

More and more manufacturers everywhere are beginning to have their attention called to the work that is being done, and the number of inquiries continually increase, taxing at times the entire output of the plant to keep up with the demand for its goods. This condition has, at various times in the past, necessitated additions to machinery, and there seems to be no doubt that the growth of this plant in the future will be of that steady character that belongs to such industries whose foundations are properly laid.

The plant is now prepared to handle large lines of lawns, in their various weights and counts; organdies, dotted swiss, madras cloth, satines, silesias, bedford cords, nainsook, nainsook checks, longcloth, dimity stripes and fancies, shirtings and cambrics of various widths, ginghams, huck towels, etc. The Turkish towel department is complete in all particulars and in quality of work unexcelled.

The president of the company has been in the textile manufacturing business since 1872. This long experience has taught him that care in the small things is essential to the greatest success.

The official organization of the works is as follows: President, Theodore C. Search, Treasurer and General Manager, Oscar W. White.

Directors: Theodore C. Search, Oscar W. White, Edward H. Sanborn, E. W. France and John W. Levering.

SCOTCH SYSTEM OF RING TWISTING.

WITH SINGLE CYLINDER FOR WET TWISTING ONLY.

The Scotch system of wet twisting was introduced into this country some thirty years ago, by the Scotch makers of sewing thread, and its use has been confined almost exclusively to the manufacture of thread since that time.

In this system the bottom rolls, which are always made of brass tubing 2½ inches in diameter, revolve in the water trough; thus the yarn in passing under the roll is immersed in the water.

The bottom rolls, top rolls, cap bars, guide rods and thread boards are all carried by a dead roll at the back of the trough. The entire mechanism is counterweighted and, being provided with a quadrant and worm at the foot end of the twister, can be easily raised from the trough to facilitate cleaning.

A great improvement in later twisters of this style lies in the method of attaching the required parts to the dead roll. Formerly it was necessary, in the event of any breakage, to strip all the parts from this roll. In later machines all parts are so attached that they can be separately removed and replaced.

The single cylinder Scotch twister is made in the 36-inch width only, but in two heights—for 5-inch and 6-inch traverse. *Fales & Jenks Machine Co.*

Before the invention of the roller card machine, wool was carded, as well as combed, by hand. This is still done by the cottagers of Scotland and Ireland. In this way a few pounds of material may be treated per day, whereas on the modern carding machine the output per day may vary from 280 to 800 pounds.

The modern way of dyeing loose wool, slubbing etc., is in closed vessels, where thorough circulation is kept up by the liquor being pumped through the material, first one way and then the other.

COTTON IN RELATION TO ITS MANUFACTURE.

BY HENRY G. KITTREDGE.

Lecture before the Cotton School of the State College of Agriculture, Athens, Georgia.

(PART I.)

It is not my intention to touch upon the cultivation of cotton as most, if not all, of you are more familiar with this phase of the raw material than I can presume to be. Rather I shall confine my remarks to the cotton fiber in relation to its manufacture into yarn or fabric, and to its behavior under the various conditions to which it may be subject during the processes of manufacture. With a true conception of the peculiarities of the fiber in its relation to the physical or chemical processes of manufacture, the farmer may have a realizing sense of some of the essential factors to be considered in the culture and breeding of his cotton by turning his efforts to their propagation so that his product shall possess a greater commercial value to the consumer, and return to him a correspondingly increased remuneration. In fact, no producer, be he a farmer or a manufacturer, can succeed as he should without first knowing the needs or requirements of his customers, so that he can intelligently adapt his methods of production, so far as they are feasible, to their wants.

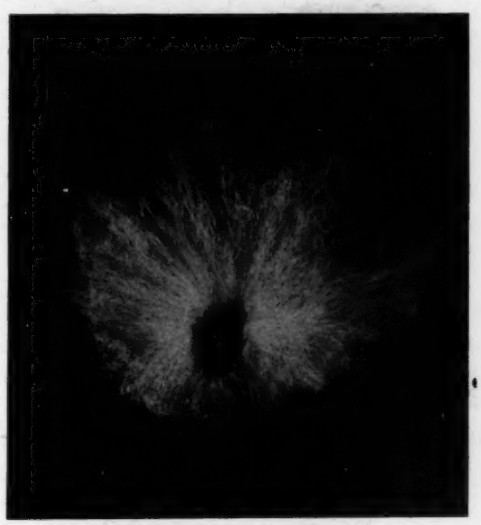
It is not every one who appreciates the fact that all cotton is not alike, however much it may appear so to the eye. Of course, one may see a difference in color, body and length of staple, but the physical vitality of the fiber is very largely hidden from view, requiring the microscope for its revelation; and its chemical vitality is still a study which scientists are pursuing without arriving at an agreement as to its nature and activity. It is of paramount importance for the manufacturer to be familiar with the physical and chemical properties of the raw material he employs, and only of little less importance for the producer to have some knowledge of them so that he shall have some comprehensive idea of the part they play in the role of manufacture upon which the intrinsic value of his product depends, to the end that he may intelligently direct his efforts toward their cultivation in perfecting such characteristics as will best serve the purpose for which intended.

THE DUTY OF THE COTTON GROWER.

The producer should study and become versed in the requirements of his customers, and endeavor to meet these requirements so far as he can in the application of science and practical experience. It would be to the advantage of every grower of cotton for him to visit a cotton mill and witness the various processes of manufacture, and acquaint himself with their operations and the reason for their employment. It would, undoubtedly, have a stimulating effect, in some way or other, in giving him a concrete idea of what is wanted from him as a producer, and how he may be a factor toward its accomplishment for his own profit. And if he would pursue his observations still further, and visit a woolen mill, he would notice that there is a great difference in the manipulation of the wool staple from the cotton staple. These two staples bear no points of similarity in their physical or chemical natures, and for this reason they require different treatment in their manufacture.

THE MICROSCOPE.

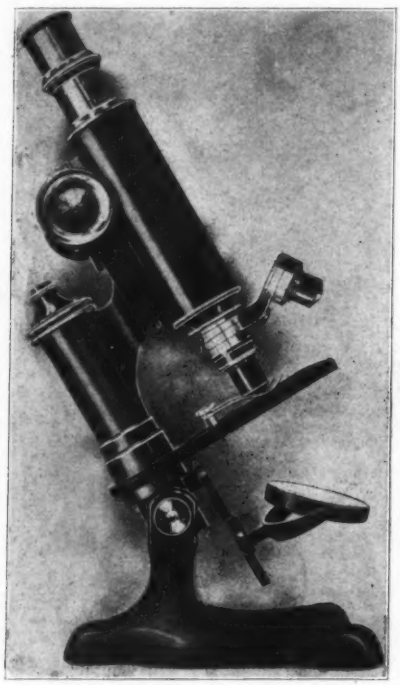
The structure of a typical cotton fiber is easily ascertained by placing it under a miscroscope of sufficient amplifying power, in a medium with proper refractive efficiency, as glycerine, Canada balsam, etc. Every one who desires to inform himself of the physical characteristics of the cotton fiber—and whoever has to do with the fiber, be he a planter or manufacturer, should so inform himself—should be the possessor of a good, but not necessarily an expensive microscope with eye-pieces and objective glasses to magnify from 200 to 600 diameters. This instrument would be found useful, and a constant source of instructive amusement, in other lines of investigation connected with other forms of vegetable production associated with farming operations. Taking into account my own experience in microscopic investigations of textile fibers, it is a mistake to put any great amount of money into a micro-



COTTON SEED WITH FIBERS.
Showing Length of Fibers on Different Parts of the Seed.

scope for ordinary purposes of this kind, unless one desires to carry his examinations to an extreme scientific limit which can be reached only by long study and research by a student trained in this form of inquiry and exploration. Good lenses, however, should be had with good definition, and penetration, but these qualities can be greatly brought about by mounting the fiber in the right kind of a medium, or reagent, as it is oftentimes called. What is known as the field of microscopic observation furnished by the objective lens—a compound lens that forms an image of the fiber or other object under examination—is of secondary importance to definition and penetration. A large field, or area, for taking in a large portion of the object, can be had only at a very considerable cost in the selection of an object glass, or lens. It is not necessary for the ordinary purposes of a microscope as here intended. To those who are not acquainted with the uses of an instrument of this kind, let me say, do not attempt to examine a cotton, or any other textile fiber in its natural state and

expect satisfaction. Mount, or place, the fiber in a suitable medium. I have found glycerine a good one for quick work, when the preservation of the mount is of no consequence. And quick work is oftentimes a matter of considerable moment when a large number of fibers are to be examined; and a large number means very, very few when compared with the number in an ordinary cotton boll, which contains not far from six to seven hundred thousand fibers. As can readily be seen, one can do very little toward examining a boll full of cotton. Even the number of fibers attached to one seed would furnish more microscopic work than most investigators would care to tackle. Therefore, in undertaking microscopic examinations, selection of fibers from different parts of a seed, for example, is the best that can be done, and, under the circumstances, all that can be done. Let no one think that his first observation through a microscope will reveal to his understanding the



MICROSCOPE.

physical structures of a fiber, for one hundred chances to one it will not, even in its simplest form. Simple as it may appear, the structure of a cotton fiber is a matter requiring careful study; and a training in the manipulation of the instrument, is a prerequisite before correct conclusions can be assumed. This training, for the purpose in question, may be that of ordinary experience or practice.

THE GROWER SHOULD GIVE THE SPINNER WHAT HE WANTS.

The cotton grower should give to his customer, the spinner, what he wants, if by any feasible means he can do so. It should be a small part of his efforts to simply raise cotton without regard to the cultivation of characteristics in the fiber as will best adapt it to the purposes for which it is intended. Length, fineness, strength and body of staple are all and every one essential features that should engross the attention of the farmer as sedulously as the amount of yield per acre. Every one of my hearers undoubtedly know how the fibers are distributed on the pear-shaped seed, and that the longer fibers are to be found on the rounded part and the shorter fibers on the smaller or tip end where it is attached to the midrib of the capsule or boll. It has been frequently observed, no doubt, that there is a considerable variation in the length of fibers, even on one seed, and a still greater diversity when the entire plexus in the boll is considered. This variation is oftentimes a source of much annoyance to the spinner in his attempts to adjust or set the several parts of his machinery so that they shall be properly accommodated to it for the production of good work with the least waste. A perfect uniformity in length of fiber on the seed, and less so throughout the boll, can never be attained, as it is contrary to the laws of nature, but a correct system of cultivation, breeding and selection of seed for planting, can improve matters to some extent, enough to be appreciated in the processes of spinning.

One of the prime objects of the spinners, both here and abroad, at the Atlanta conference of spinners and cotton growers, held in October, 1907, was to impress upon the growers the merit and value of cotton of even running staple and grade, which has been carefully picked and ginned, for which a willingness was expressed to pay a price that would be remunerative for any extra cost of production. In order that improvements in the character of the staple shall be of the greatest commercial value to both growers and spinners, they should be widespread, covering the product of a section or territory contributory to a central mart where cotton can be bought in considerable quantities for the peculiar necessities of manufacture. One or an inconsiderable number of bales of such improved cotton would not be an inducement to a spinner to consummate a purchase at any material advance in price over that commanded by the ordinary growth. To effect a benefit to every and all planters, it would become incumbent upon a large number of them to labor together toward a common and well defined end. Concerted action is a desideratum if the greatest good is to be obtained.

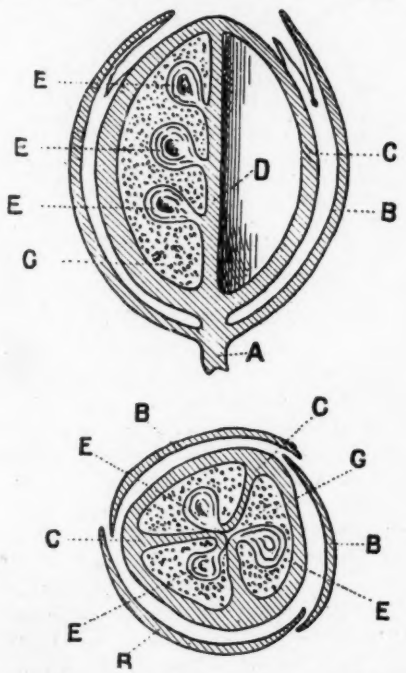
COTTON SHOULD BE PROTECTED FROM THE WEATHER.

Improvements in the character of the staple would be of little avail if the cotton were badly or insufficiently cared for after being gathered from the plant. It should be protected from weather inclemencies at all times. This is recognized by every one, yet how many there are who ignore it, willfully and deliberately, notwithstanding it has been subject to more condemnation than most anything else, while there is nothing in the handling of cotton that can be so readily rectified. Cotton, therefore, should be housed and thus protected for at least thirty days before ginning, or till it is thoroughly dried or cured. There is at least one thing certain, it should never be ginned while damp, and one may go further and say that it should not be ginned in damp weather. Aside from the damage done to the staple in the ginning process while it is wet, the farmer would be studying his advantage by letting his cotton lie in his storehouse for a month or more before ginning so that it may receive the benefits of its after-growth, so to speak, which is attributed to it as it remains on the seed after harvesting, developing in strength, length and flexibility, and in other qualities that are associated with maturity and good spinning.

FEATURES WANTED BY THE SPINNER.

The spinner has some well settled points in his mind when he makes a purchase of cotton, especially if it is

for counts finer than medium. Of all things he gives precedence to strength and uniformity of staple, and length suitable to the fineness of yarn that he desires to make. There are other qualities that have a determinating influence in his selection, as elasticity and fineness of fiber. Uniformity in the length of the staple is of great importance, as without it he can not turn out even work, because he is unable to set the drafting rollers on his spinning machinery to the best advantage, and should he comb the cotton his waste account might be excessive. This particular quality of uniformity, I am inclined to think, is of the first desideratum, as more depends on it than on any other one thing for satisfactory production in all of the branches of manufacture from the cleaning to the final process in spinning. Average length of staple is not wanted if it is accompanied with irregularity, for a proper adjustment of the working parts of the machinery can not be



SECTIONS OF CAPSULE. LONGITUDINAL AND TRANSVERSE.

A. Stem, B. Section of Calyx, C. Section of Carpel,
D. Midweb, with seed attached, E. Section of Seeds
G. Plexus of young cotton.

effected. The only thing that can be done in such a case is some sort of a compromise, which, at the best, is never satisfactory in cotton spinning more than in anything else. A one-inch stapled cotton, of uniform length, is of more value to a spinner, than that which is of one and one-eighth-inch staple of variable length, even for the same counts of yarn, because he can get a larger and better production, with less waste, and at a less labor cost, which is, to a certain extent, a fixed charge, and can be reduced per unit of production by increasing the amount of the work done.

There will appear in all cotton a greater or less percentage of unripe and immature fibers. This can not be avoided as all the fibers on any one seed are not of the same maturity. It is not in the nature of cotton development for it to be otherwise, and this being so, it is a factor that must be taken into account on the part of the manufacturer not only as affecting the strength of his yarn, but as affecting what he desires to attain in dyeing his product, especially for light shades. The first or early pickings of cotton are more liable to have a larger proportion of these imperfect fibers than those taken later in the season. This is one of the reasons why spinners prefer purchases of cotton made in the middle or at the last of the growing season, if for immediate use, even of that which may have been gathered early, for it is an accepted fact that the maturity of the fiber continues after it leaves the plant. Good cotton must be had in order to make good yarn, notwithstanding the fact that machinery has been so improved as to enable it to spin the raw material 33 1-3 per cent. finer than was the case at one time. For example, No. 40 yarn can now be spun from the same cotton that formerly could not be made to go finer than No. 30.

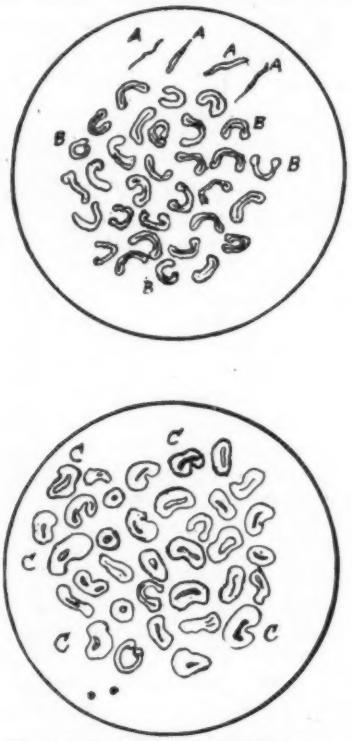
INFLUENCE OF THE WEATHER.

There is no one cause for the presence of the imperfectly formed fibers in a boll or on a seed. The relative position of the fibers in the boll or on the seed may have something to do with it. Unless the fibers obtain nourishment and vigor from sunlight and the atmosphere they can not reach a healthy state of maturity. Thus, the season oftentimes has much to do with the development and ripeness of cotton; and a sunshiny season is much more conducive to a perfection of growth than one that is rainy. The spinner knowing this to be so, anticipates accordingly the character of the cotton he will have to use of any particular season, not only concerning its working qualities but the amount of waste it will produce. For example, the almost ideal weather that prevailed last year (1908) during the several periods of planting, germination, development and fruitage, has given to the spinner a grade of cotton that is serving him well for his manufacture in both quality and cleanliness, with little waste. Thus it will be seen that climatic influences have much to do with the characteristics of the fiber, quite as much if not more so than the kind of seed upon which it is grown. Cotton is a weather product to an extraordinary extent. There is sometimes generated within the lumen or central cavity of the fiber, in a very damp season, a fungus growth that has a tendency of destroying or weakening the tissues of its cellulose structure, to an extent sufficient to materially affect the manufactured product in strength and durability. This same effect is at times noticeable in cotton that has been packed damp and allowed to remain in this condition some length of time.

It may be an accepted rule, that a cotton crop with a large yield per acre provides a more healthy staple than one that is the product of a short yield. Compare the crop of 1908 with that of 1907. The reason for this is that the same climatic influences affecting the yield also affect the fiber. Hence, no two crops can be said to be alike, or enough so to allow the same manipulation in the various processes of manufacture. Each crop has to be treated with due consideration to its peculiar properties, such as an abundance or deficiency of natural oil, and others already enumerated; all having their distinctive effect upon the behavior of the cotton in the course of manufacture. The sufficiency of natural oil is a matter of much moment to a spinner in selecting his cotton, enough, it may be, to determine his purchase between several lots. Suppleness and pliability in the working of his cotton depends on the amount of oil it contains.

TENSILE STRENGTH.

While uniformity in the length of fibers is a highly important factor to the spinner for perfection of work and product, uniformity in strength is scarcely less so, especially if he is to apply his cotton to the manufacture of warp yarns, or any other that has to be subjected to tension. The strongest fibers, of course, are those which attain the development of full maturity. It is, however, a demonstrable fact that there is as great a variation in the tensile strength of cotton fibers as there is in their length, and this applies to all species and varieties—American, Egyptian and East Indian—but the average breaking strength may be given at not far from 130 gains, in a range of 80 to 190 grains. The strength of a single fiber is not always a fair criterion of its comparative value in this respect, as its relative diameter should be taken into consideration when data of this kind is to be ascertained. When diameter is referred to, it should signify that calculated from the area of a cross section of the fiber as computed by means of a planimeter or other method of measurement, taken from a drawing of an image cast upon a screen or sheet of paper by a camera lucida attached to the eye-piece of the microscope. It should be remembered that a fiber is not a cylindrical body with circular cross sections, but one whose sections are irregular in outline much like an ellipse collapsed at its minor axis. Incidentally it may be remarked that it is not safe to figure on the diameter of a cotton fiber as seen under the microscope, for the major diameter is the one generally in view because of its inclination to lie on its flattest and longest side. Especially is this the case with a well formed and fully developed fiber, which, so to speak, is a flattened cylinder, more or less twisted, while a kempy fiber, or one of solid structure, is nearly round, exhibiting under the instrument a smaller diameter, it may be, though the transverse section may be of larger area. Fiber for fiber the one that will stand the greatest breaking strain is the Surat variety grown in East India, because it has a larger sectional area, but in proportion to this area the Sea Island and Egyptian cottons are stronger. As a rule the strength of cotton fibers varies with their sectional area, presuming they are of equal maturity and structural development. In this connection, it may be said that so far as strength and properties affecting durability are concerned there is no cotton grown that equals the common upland varieties that are raised in our Southern States. It is the best cotton for the wants of the great masses of the world. Roundly speaking the cotton fiber is more than three times stronger than wool, nearly as strong as silk, and about one-half the strength of steel.



TRANSVERSE SECTIONS OF FIBERS.

A. Unripe or immature fibers.
B. Partially ripe fibers.
C. Fully ripe fibers.

(To be Continued.)

Last month we had the pleasure of a call from Robert Schaellibaum, Providence, R. I., who tells us that his grid is meeting with unqualified success wherever it is introduced in the southern cotton mills.

CANCELLATION OF CONTRACTS.

R. M. Miller, Jr., president of the Cotton Manufacturers' Association of North Carolina, has written to the *Journal of Commerce*, New York, a communication that will be read with much interest by the cotton manufacturers of the South and elsewhere, relating to the cancellation of contracts that are placed upon the delivery of goods. Considering the important points touched upon by Mr. Miller, and by reason of his prominent position as an authority in the cotton manufacturing industry of the South, we reproduce his letter as below:

Replying to your recent request to give you my views of the exceedingly hard year through which our cotton industry has passed, permit me to say that next to the panic, if not on a par with it, the cause of the greatest loss to us has been due to cancellation of contracts.

The methods adopted by some buyers to cancel their contracts during the recent depression and declining market were disreputable and dishonorable and carried to such extremes in many cases, in their desperate efforts to hedge or save money loss, that if the facts were submitted to a jury of their own peers the verdict would be "guilty" and without recommendation to mercy.

I feel, therefore, that the greatest menace threatening our trade relations to-day is the apparent lack, and sometimes the absolute lack, of business honor and integrity.

During the past two years the cotton manufacturers have been hit as the saying goes, both "g'wine and comin'."

Believing we held an honest contract with the buyer, we sustained as an industry enormous losses on the advancing market of two years ago by standing to and making good our contracts when in many instances on the day of shipment we could have sold the same goods at advances from 25 per cent. to 33 1-3 per cent. over the contract price.

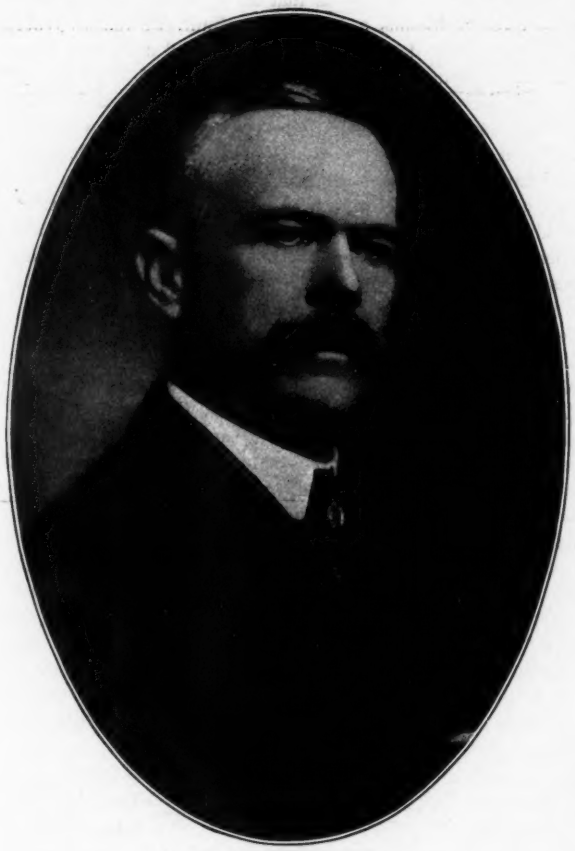
A year later conditions were reversed and we had a declining market, when we sustained equally if not greater

losses by contracts being cancelled and deliveries being repudiated by the buyer.

By this method of trading it is evident that the seller stands absolutely no chance to win, and the buyer absolutely no chance to lose. Such a condition is contrary to all law, fair dealing and common honesty.

If business honor and integrity is at a discount in our trade then the law should be invoked for our protection and the punishment meted out should be so severe that no guilty one should escape.

Contracts were cancelled during this period entailing heavy losses without any just cause, on mere pretexts and technicalities, and instances are known of total cancellations of large contracts when the date of shipment was only one day late on deliveries promised six to eight months



R. M. MILLER, JR.

in advance and cancellations made also because of the shipment of one defective piece of goods in lots of thousands, and apparently the laws of some of the States protect this injustice.

When conditions were such that cancellation was not considered the wiser course to pursue, then the postponement of delivery was resorted to as a safe and honest (?) method of escape from bona fide contracts.

The difference between cancellations and indefinitely postponed deliveries is just the same difference as between tweedledum and tweedledee, but certain results were to be gained even at the sacrifice of common honesty and truthfulness.

The modus operandi is simple. The buyer goes into the market when, in his judgment, conditions warrant it, and when he deems prices low enough and in some cases premeditatedly and cold-bloodedly reasons that, if perchance his judgment is wrong and prices should show a further decline, his conscience, already seared possibly by similar past experience, permits him to deliberately cancel all of his purchases and commitments. On the other hand, however, if his judgment is good and the market advances then he has been "smart," knowing that his mills will deliver the goods, so, under either condition, he can not lose.

We have no cancellations and postponement of deliveries on an advancing market, but to the contrary, if the mill does not live up to delivery we receive vicious threats that "if you do not make shipments as per your contract we will go into the open market, buy goods to equal your delayed delivery, charge to you, and, if necessary sue you for the difference." This is the medicine given the seller as an invigorating and helpful tonic.

Some buyers, and I say some advisedly (all honor to them) do meet their obligations and do live up to their contracts honestly and fairly and measure up to the full standard of the man, but many (shame on them be it said) seem to knowingly and willfully repudiate an honest contract or agreement to protect their bank accounts.

This nefarious practice is as damaging in its results to the legitimate and honest buyer as to the manufacturer because he accepts delivery on his orders and pays his bills, while his competitor repudiates his contracts—bought possibly at the same time, from the same mill and at the same price.

The exposure of those guilty of these iniquitous methods is only a matter of a very short time, as their removal from the legitimate trade channels will be demanded for the protection and respect of the honest buyer and manufacturer.

Humiliating as the statement may seem, practically every cotton mill in the country (I know of no exception in this section) has suffered by these cancellations of contracts, repudiation of deliveries and price concessions, to such an extent greater than all of the losses entailed by the recent financial depression.

THE MISSISSIPPI CHILD LABOR LAW.

VIEWS OF THE SECRETARY FOR THE SOUTHERN STATES NATIONAL CHILD LABOR COMMITTEE.

Editor Cotton: I note in the November issue of COTTON, a discussion of the child labor law of Mississippi. First we have a condensed statement of the law as passed, then the action of the Textile Manufacturers Association, of Mississippi, of which T. L. Wainwright is president, and J. H. Ledyard, secretary. Then the views of Mr. Wainwright, and of Senator James R. McDowell as to the law itself.

The history of this legislation is interesting. The manufacturers' lobby had hitherto prevented the enactment of any child labor law for Mississippi. In the fall of 1907 I had Rev. A. E. Seddon of this city make an investigation of the Mississippi cotton mills, and he did investigate about half of them. I desire to say in justice to Mr. Wainwright and Mr. Ledyard, that their mills were among the best visited with respect to child labor conditions; yet in Mr. Wain-

wright's mill at Stonewall, out of thirty-seven children examined, twenty-nine were illiterate. Mr. Seddon talked personally with a large number of the children and their parents, and from his investigations estimated that 25 per cent. of the Mississippi employees were under 14 years of age, and that 50 per cent. of the children employed were illiterate.

On October 14 and 15, 1907, I attended the Southern Textile Conference at Nashville, Tennessee, to which representatives of all the textile mills of the Southern states had been invited, as well as the representatives of the labor unions, and of the humane associations devoted to the welfare of the children. Only the Tennessee cotton manufacturers were present, however, among them J. H. Ledyard, who has factory interests in Tennessee as well as in Mississippi. Manufacturers from other states declining to come. An agreement was made, however, to give the manufacturers present an equal vote on the floor with the other interests represented. Mr. Ledyard and I were both members of the committee on resolutions. One of the questions thoroughly discussed was that of the working day for children. Some contended for a fifty-four hour week, the manufacturers for a sixty-hour week, and a compromise was effected so that the committee on resolutions made a unanimous report which was unanimously adopted by the conference. Among the resolutions adopted by way of recommendation to the Southern textile states were the following:

1. A 14-year age limit for the employment of children in manufacturing and mercantile enterprises and in the street trades.

2. A 60-hour week to be adopted at once and a 58-hour week as soon as practicable for women, and for children under 18 years of age.

3. The prohibition of night work for children under 16 years of age.

4. Compulsory education for children between 7 and 16 years of age.

5. Adequate factory inspection.

6. The adoption of all proper sanitary measures and safety regulations.

I was invited to attend the meeting of the Mississippi Child Labor Committee at which Senator McDowell presented the bill which he had drawn. The bill had a 14-year age limit, but a shorter working week than the fifty-eight hour a week recommended by the conference for adoption in the Southern States. As secretary of the National Child Labor Committee, for the Southern States, I felt bound by the action of the conference, of which I was a member, and by my vote in that conference, not to advocate legislation in advance of the standard set by the conference. I, therefore, informed Senator McDowell and the Mississippi committee that if they wished the co-operation of the National Child Labor Committee in the pending fight before the legislature, the 58-hour week, and nothing less than that, would have to be inserted in the bill. This was accordingly done.

I had supposed that what I regarded as binding upon myself would have been regarded as binding upon any manufacturer who was a member of the textile conference. To my very great surprise, Mr. Ledyard appeared among the lobby of cotton manufacturers in opposition to the 14-year age limit in the original bill, and in opposition to the 58-hour week even for children under 16, when the conference had recommended the 58-hour week, as soon as practicable, and the meeting of the legislature made it practicable, for all women and for children under 18 years of age.

I note that in the meeting of the Mississippi Textile Association, of which Mr. Ledyard is secretary, the 63-hour week is still recommended for the women as well as for the men, and that according to President Wainwright "it is the unanimous opinion of all the mills of this state that the recent child labor law passed by the Mississippi legislature was most radical and unjust alike to the mills and to the employees." I confess that I am unable to understand Mr. Ledyard's position in this matter according to the ordinary requirements of good faith.

When Mr. Wainwright says, "I have before me copies of the child labor laws in all the states of the South, and will say that we have the most stringent of any of them," the least that can be said is that he is mistaken. For example, Kentucky has a 14-year age limit, with a 16-year age limit for all dangerous occupations, and a 10-hour day for children under 16. Tennessee, Arkansas, Louisiana, Virginia have all adopted the 14-year age limit, and none of them have over a 60-hour week, when present legislation is in full effect. It is true that North Carolina and Georgia still have the 66-hour week, but North Carolina has a 13-year age limit and Georgia a 14-year age limit for illiterate children, with the provision that children under 18 shall attend school at least three months of the year. Alabama has virtually the same provision as Georgia with a 60-hour week. In fact, the only states left in the Union with a 12-year age limit for the greater part of the year, are Maryland, South Carolina, Florida, Georgia, Alabama, Texas and Mississippi. The 14-year age limit is the standard for the United States and for Europe. South Carolina prohibits women as well as children from working more than 60 hours a week. The legislation of all these Southern States, with a low age limit, and the long working day for women and children, should be amended for the better protection of the employees. Personally, I do not see why Mississippi with the cotton mill in the cotton field should have a less humane standard than Massachusetts with a 14-year age limit and a 10-hour day and a 56-hour week. And such great manufacturing states as New York, Ohio and Illinois together with Nebraska, Wisconsin and Colorado have an 8-hour day for children under 16 or 18; while California, Delaware, Florida and Missouri among others have a 54-hour week.

A. J. MCKELWAY,

Secretary for the Southern States National Child Labor Committee, Atlanta, Ga.

NINE STANDARD GRADES OF COTTON.

Great interest has been manifested by the entire cotton industry in the establishment, through the U. S. Department of Agriculture, of the nine official grades directed by congress to be prepared. This interest has been of a very practical and helpful nature, nearly all the important cotton exchanges of this country and Europe having contributed their standards free of cost, for the use of the experts engaged in establishing the grades. The growers, manufacturers and exchanges have all cordially assisted in many ways.

The cotton exchanges of the following cities have contributed copies of their standards: Augusta, Georgia; Bremen, Germany; Charleston, South Carolina; Charlotte,

North Carolina; Galveston, Texas; Little Rock, Arkansas; Liverpool, England; Manchester, England; Macon, Georgia; Memphis, Tennessee; Mobile, Alabama; New Orleans, Louisiana; New York City, New York; Vicksburg, Mississippi, and Waco, Texas.

It is expected that other exchanges will also contribute.

Secretary Wilson of the Department has appointed the following business men, among others, all widely and favorably known for their success in the cotton industry, as a committee which met in Washington, February first, to act in the matter: J. A. Airey, of John M. Parker & Company, New Orleans, Louisiana; Joseph Akers, of Inman, Akers and Inman, Atlanta, Georgia; F. W. Crump, of F. M. Crump & Company, Memphis, Tennessee; John Martin, Paris, Texas; George W. Neville, of Weld & Neville, New York City, New York, and Lewis W. Parker, Greenville, South Carolina.

In further reference to the foregoing, Dr. N. A. Cobb, who is in charge of the matter for the Department of Agriculture, writes us that "It is expected the members of the committee will bring with them to Washington a large number of samples of cotton of all grades. The duties of the committee appointed will be to consider the proposition of establishing standard grades from all points of view and inform the secretary of its views. Also to suggest the grades which in its opinion should be made standard for the United States. In the event that the secretary approves the grades recommended and establishes standards accordingly, immediate steps will be taken to prepare a large number of duplicate sets to supply the cotton trade."

Relating to this subject, Congressman O. C. Wiley, of Alabama, introduced in the house of representatives last December, a bill which read as follows: "The secretary of agriculture be, and he is hereby, directed to fix a standard of cotton classification in the transaction of cotton business by the exchanges in the United States.

"When the same has thus been fixed, all exchanges must thereafter use the same and have the same rule for receiving, delivering, and tendering grades of cotton on contract, and the difference between the grades must be the same at all places where exchange business is done, and the grade thus established is hereby declared the official standard of cotton classification. The secretary of agriculture is hereby authorized and directed to prepare, in the most practical form, said standard of cotton, and on request shall furnish same to any person interested in agricultural pursuits, any farmers' institute, union, or association, or to any cotton spinners' association, or to any agricultural school or college, or to any cotton exchange dealing in bona fide sales of cotton for future delivery, upon a request being submitted to him therefor, in each instance the exact cost for furnishing said standard to be paid when the same is delivered by said secretary, certified under his signature and the seal of his department, to the institute, union, association, or exchange requesting same."

Representative Albert Burleson of Texas, who was the original author of the provision for the standardization of cotton grades, whose adoption afforded the basis for the cotton conference believes that the public sentiment of the country is strongly in favor of making the grades to be determined by the department with the aid of outside experts compulsory. He is in receipt, it is stated, of letters from many different sources including some of the most influential men connected with the cotton trade of New York and New Orleans, besides many growers and manufacturers of cotton, in which they urge that if possible the grades when finally determined be made official and that their use be made compulsory upon the exchanges of the country as the foundation of their cotton contracts.

Mr. Burleson is studying the subject and is desirous of getting detailed and accurate suggestions on the legal phases of the issue. Congress refused to enact a provision of this sort when proposed by Mr. Burleson about a year ago, limiting itself to the provision for standardization of the grades fixed by the department to be used or not, as individuals choose, but it is felt that opinion has shifted toward compulsory observance of the standard grades.

COTTON FACTORY CONSTRUCTION.

A Concrete Constructed Factory Costs 10 to 15 Per Cent. More Than One of Ordinary Construction. Advantages and Disadvantages of Concrete Construction. The Best Engineering Advice Required.

BY MORTON C. TUTTLE.

Concrete factory construction has come into such prominence that some statements regarding the merits and defects of the construction and the details which should be considered in selecting a concrete factory may prove of interest, especially as the suggestions come from one of the officers of the *Aberthaw Construction Company*, Boston, the pioneer firm in reinforced concrete in New England, and one which has handled all types of concrete construction from dams to factory buildings.

The very common claim that properly designed concrete factories can be built for the same price as ordinary mill construction has not been supported by their experience. It is safe to say that a well-built concrete mill will usually cost from ten to fifteen per cent. more than a factory construction building capable of supporting the same loads on the floors and columns. When the material and labor entering into concrete are exceptionally cheap and heavy lumber and brick are exceptionally high, the concrete building will sometimes prove the cheaper, but this condition is rare and general statements as to concrete factories being cheaper than mills with wooden floors, as a rule, are to be discounted or should be accepted only after satisfactory demonstration of the fact.

The selection of a concrete mill in preference to one built of other material comes from its being thoroughly fireproof, having low maintenance charges, and because of the rapidity with which it can be built and put into operation. The objections to these buildings come from the difficulty in moving machinery about, and in the case of the skeleton pier and window construction in northern climates, there is the added cost of heating, though usually a minor objection. The objection so commonly met, that it is difficult to attach shafting to the ceilings, comes from lack of familiarity with the various satisfactory schemes offered for this purpose; and it is safe to say that any well-informed designer of concrete can offer several methods for such attachment, any one of which is satisfactory.

There is no ground for argument that it is more ex-

pensive to rearrange machinery and cut belt holes in concrete than it is in a wooden floor. This is a matter of increase of an incidental expense of mill operation and does not amount to a serious obstacle if the other merits of the concrete building are attractive.

The two accompanying illustrations show two separate types of all-concrete construction. One is the solid wall type in which the exterior might as well be of brick as of concrete; and the other is the common type of skeleton construction with windows filling the space between the exterior columns. This is the commonly accepted style of concrete factory because it is more quickly built and is cheaper than the solid wall variety, and offers better light.

It is to be thoroughly understood that a badly built concrete building, or one improperly designed for its work, is as bad a building as an owner can put on his premises. It is more difficult to reinforce the strength of a weak concrete floor, or to repair the defects in bad concrete, than it is to rebuild or strengthen a wooden mill, and for this reason the owner should satisfy himself completely that the design of the building is heavy enough and that the workmanship that goes into it is first class, else in a very short time he will find himself the owner of one of the solidest white elephants that is offered in the market of this world.

Much bad mill construction results from the common practice of owners in asking for competitive designs from a number of contracting firms. This proposition, in effect, says to the competing contractors: "We know little about concrete design but we want the cheapest building you can build." It takes away all incentive to design anything but the cheapest, puts a bonus on the inferior, and helps select the firm having the least conscience. If competition is desired between various building firms of unknown merit, the only sensible thing is to engage the best structural engineer that can be obtained, get him to design the building completely in every detail, and inspect the work carefully during its building. Incidentally, an engineer can usually save the owner much more than his commission in the selection of material, the arrangement of the mill, and in detail which he has learned from his experience.

TYPICAL SKELETON FRAME. CONCRETE CONSTRUCTION.

If the owner understands thoroughly the proper arrangement of the building which he proposes to buy, and needs no suggestions except structural details, and does not wish to employ an engineer, he will probably find it good sense to select the best concrete firm available, and put the matter in its hands under some type of contract which makes his interests and its own as nearly identical as possible, rather than try to save money by getting the cheapest design and lump-sum bid available. And even with this arrangement, it will be unusual if he does not, at some time during the job, wish he had the services of a first-class structural engineer whose unbiased advice he could take. For instance, if the owner has decided that a live load of 150 pounds is the least that he can get along with safely, it is fairly difficult, as a rule, for him to check up the design well enough to know whether a given concrete floor will carry 150 pounds with a proper factor of safety. It is safe to say that any concrete floor should be made strong enough so that there shall be very small vibration under its working load. In as brittle a substance as concrete, continued vibration may very well lead to trouble and accordingly the light design may well prove dangerous.

FACTORY BUILDING WITH SOLID CONCRETE WALLS.

All of which is merely saying what is true of any building material. Concrete, well handled, is as safe, and its strength can be calculated, as closely as any material entering into building operations. To say that the strength of two batches of concrete varies is simply equivalent to stating the same fact regarding any two sticks of hard pine timber. The calculations used by the best engineers are based on thoroughly safe assumptions, and only require intelligent handling by men who appreciate the necessity of placing sufficient steel in positions shown in the design, and of handling the material as thoroughly and with as much cement as the engineer specifies.

The best firms in the business can build a concrete building as accurately, and more cheaply, and more quickly than any other type of fireproof construction, and the summary of these remarks is that if concrete is to be used for building operations, it should be handled by engineers and firms trained in handling this material, and not given out promiscuously to the cheapest or most available concern.

How bobbins are wound on the roving frame is often puzzling to even practical men, but it is simplicity itself. So many inches are delivered by the front roller per minute, and just the same number of inches must be wound upon a bobbin in the same time.

COTTON MANUFACTURING

THE MAKING OF A THREAD.

THE FLYER DOUBLER OR TWISTING FRAME.

BY SAMUEL WARD.
1st Honors Silver Medalist and Clothworkers' Company Prize. Lecturer in Cotton Spinning.

PART III

The flyer doubler or twisting frame is an adaptation of the principles embodied in the older throstle spinning frame to doubling. There is, however, one important difference in the construction, viz: the fluted drawing rollers being unnecessary for the twisting machine are dispensed with and substituted by one line each of top and bottom rollers, much larger in diameter than those used in the spinning machine, therefore no drafting can take place. The purpose of these rollers is to control the delivery of the yarn in relation to the revolutions of the spindles and flyers,

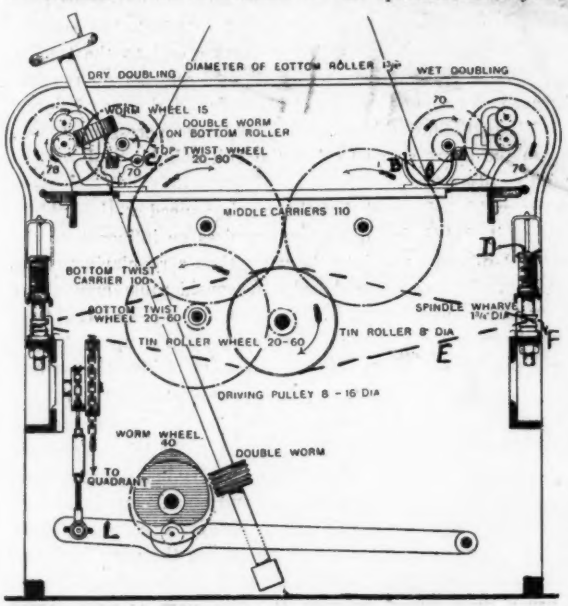


FIG. 3.

and thus determine the number of turns or twists, per inch delivered, given to the doubled strands.

This machine is the best type of twisting machine for extremely fine, soft twisted yarns, and very coarse counts, so far as the quality of the product is concerned, but the quantity produced is rather lower than the twiner. The flyers are made in two shapes, one with an outside curl and the other with an inside curl. The latter is the best for most varieties of yarns on account of centrifugal action, as there is less liability of the legs catching, and also the fact that larger bobbins can be made, which, where especially coarse counts of embroidery are being made, is a consideration, although for very hard twisted yarns the outside is preferable because it gives more surface for the friction of the yarn and prevents the flyer eyes wearing so quickly.

Fig. 9 is a section through a flyer doubling frame and using this for reference a brief description will now be given:—

The yarn to be twisted is mounted in the creel as shown in Fig. 10. It is drawn from bobbins, cheeses, or cops by the rollers. Before reaching these, however, the yarn passes under the glass rod *A*—see Fig. 9—in the water trough *B* if it is to be twisted wet, or under a plain guide rod *C* of iron in lieu of the glass rod if it is to be twisted dry. The yarn may now pass forward in one of two ways:—

(1) Underneath the bottom roller and over the top roller as shown in Fig. 11, or

(2) Between the two rollers, over the top one, around a glass stud *X*, and between the two rollers a second time as shown in Fig. 12.

On leaving the rollers the yarn is passed through a thread guide, generally of brass, to the flyer. The yarn is wrapped once or twice around one leg of the flyer to obtain sufficient tension, and thence through the curl at the foot of the flyer to the bobbin.

The method by which the yarn receives its twist is easily seen, one end being held by the rollers whilst the other is revolved by the flyer about its axis, and therefore twisted.

The method of winding the yarn on to the bobbins is not quite so easy to follow, and a consideration of first principles may, at this stage, be useful. The three conditions under which winding is possible are as follows:—

(1) The bobbin may be revolved to draw the yarn on to itself.

(2) The bobbin may be stationary and the yarn be carried round it, or in other words, laid on to it.

(3 The bobbin may revolve and the yarn also, but to produce winding one must travel at a greater rate than the other.

What actually takes place on this machine is a modification of No. 2, i. e., the yarn is carried round the bobbin, but owing to its speed being greater than the delivery of the rollers the bobbins are dragged round by the yarn connecting the flyer to the bobbin, the bobbin being allowed to lag behind the speed of the flyer a number of revolutions equal to the delivery of the rollers. To prevent "over-running" on the part of the bobbin, flannel washers are placed between the base of the bobbin and the bobbin rail upon which it would otherwise rest, thus setting up a sufficient drag to keep kinks or snarls out of the yarn, in addition to the primary reason stated—the prevention of over-running.

In the case of heavy or highly twisted yarns it is necessary to introduce an additional drag on the bobbin to prevent, as far as possible, an inordinate amount of "milling up," or contraction, in the yarn consequent upon the twist being put into it. This extra drag is introduced at the bottom of each bobbin, the edge of which is prepared with a groove in which the drag band is fixed. This band passes alternately in front of one bobbin and behind the next, being suitably connected at each end of the machine. Provision is made at one or both ends of the machine for regulating the tension on the band, and, therefore, the drag exercised on the bobbin. The drawback to this method is

that the bobbins near the ends of the machine are liable to receive an extra drag consequent on the direction of revolution of the bobbins, and for this reason if no other, a better plan is to have a separate drag band and weight for each bobbin with an arrangement at one end of the machine for adjusting the drag on all bobbins, on one side, simultaneously. This arrangement is shown in position in Fig. 9.

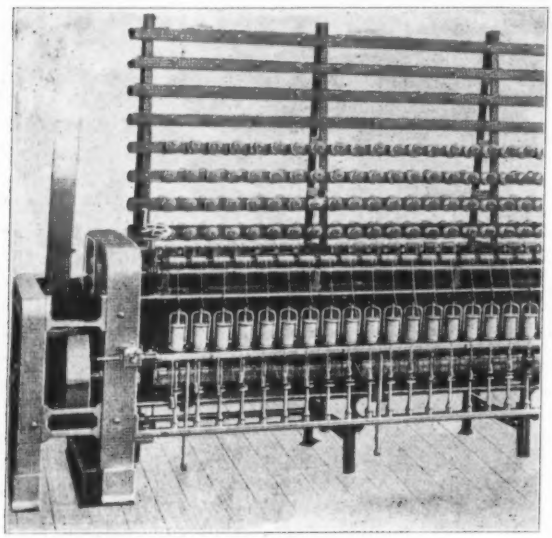


FIG. 10.

The spindles are driven by a tin cylinder (Fig. 9) by means of an endless band *E*, which passes round a whirl *F* secured to the spindle on which the bobbin *D* is mounted. The bobbins are not connected to the spindles but are free to revolve independent of them, subject, of course, to the pull on the yarn between the flyer and the bobbin. This is an old principle, but none the less interesting, and for this, if no other reason, it is worth examination in passing.

If the yarn is guided from the rollers to the bobbin, in the manner described, and wrapped round the bobbin barrel a few times to enable the yarn to take over the control of

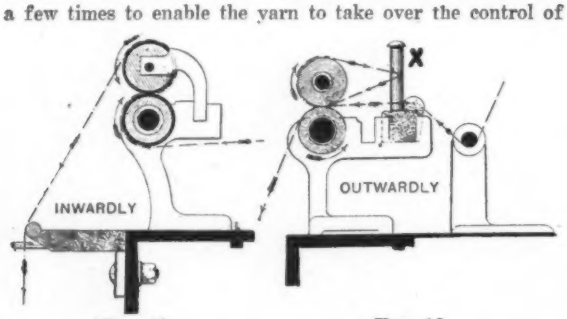


FIG. 11.

FIG. 12.

the bobbin, and if the rollers be disconnected it will be found when the machine is started that the bobbin and spindle will revolve at the same speed, owing to the pull on the yarn between the flyer and the bobbin. Under these circumstances the yarn held by the rollers would be twisted, no winding whatever could, under these circumstances, take place; but on connecting the rollers and restarting the frame provision has to be made for the yarn delivered by the rollers. This is secured by reason of the relaxed pull on the yarn permitting the bobbin to lag behind the speed of the flyer and thus coil the yarn on to itself. Twist is also taking place meanwhile by reason of the manner in which the yarn is guided round the flyer, and the turns per inch are, of course, decided by the relation between the speed of the flyer and the delivery of the rollers.

Referring to Fig. 10 it will be seen that the rail which carries the footsteps for the spindles is fixed, the spindles receiving a rotary motion only, but the rails carrying the bobbins are given a vertical movement by a heart cam and levers (Fig. 9.) Thus the bobbins are moved past the eye of the flyers to enable a correct distribution of the twisted yarn between the two heads of the bobbins.

The type of spindles shown in Fig. 10 is the plain kind similar to that used on the original throstle spinning machine, but the spindle shown in Fig. 9 is the well known "gravity" kind which is very largely adopted at the present time for the finer qualities of yarns when this machine is used. It is, however, more or less imperative that the former spindles be used in the production of the heavier yarns to give greater rigidity and to withstand the enormous strain to which this yarn subjects it.

The spindles and flyers usually revolve weft way; that is, in the opposite direction to that in which the yarn is usually spun, and as the flyers are screwed to the top of the spindles these "fix" the direction in which they revolve, because any change of direction requires a change of flyers.

When doffing takes place it becomes necessary to remove the flyers so as to doff the full bobbins and replace with empty ones.

It will be observed that the varying speed of the bobbin, due to its increasing diameter, exercises no influence on the amount of twist put into the yarn, thus a regularly twisted and round yarn is produced. A considerable amount of very fine two-fold yarn is twisted on machines of this type direct from mule cops of single yarn 120s upwards, for lace purposes, and in this respect it resembles the twiner.

One common type of creel for this class of yarn has the cops on wooden or steel skewers loosely mounted in porcelain footsteps to enable the yarn to be taken from the cops by pulling these round, the skewers being fixed at an angle to prevent "over-running" and slack yarn. Another and better arrangement is shown in Fig. 12A. In this the cops are mounted on stationary skewers, the yarn is drawn from the ends of the cops in the manner shown, and passes over a drag board, or rods *D*. The yarn is now passed under the glass rods in the trough and thence to the rollers in the manner previously described.

The advantage of this system over the older one is obvious, because there is no reasonable likelihood of slack yarns due to "over-running;" and any tendency to slackness, —which there may be,—or snarls, is speedily remedied when the yarn passes over the drag board or rod *D*, each cop being subject to the same tension, resulting in the ends being uniformly drawn and the strands presented to the roller with a uniform tension. It is not usual to pass more than two strands at a time to any one spindle owing to the risks of "singles."

By far the greater quantity of yarn to be twisted on this type of machine, is for preference, previously wound on the winding frame, onto double headed bobbins or cheeses, and although this method introduces the additional process of winding it is more than questionable if the addi-

tional cost is not amply compensated for in that the tenter is able to look after more spindles by reason of the less creeling. The strands being all of one tension the breakage of ends are thus reduced to a minimum.

The turns per inch in yarn varies so much for the same counts and folds that the following table of productions for the flyer doubling machine should only be taken as the basis for what can be obtained, as much also depends upon the help given at doffing time, particularly is this the case in coarse counts.

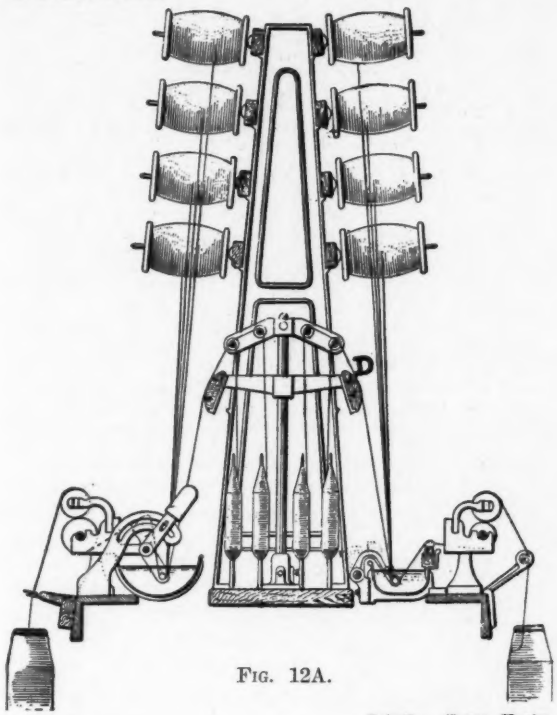


FIG. 12A.

Kinds of Yarn	Counts	Spindle speed	Turns per inch	Hanks in 56 hrs.
Crape Yarns	40/2	4200	22	17.3
" "	50/2	4500	32	12.7
" "	60/2	4200	27	14.1
" "	100/2	5000	35	12.9
" "	100/2	4500	46	9.0
" "	140/2	5000	41	11.1
" "	200/2	5000	50	9.0
Preparing for Heald Yarns.	30/3	4000	16	23.0
	50/3	4000	20	18.0
	100/3	4000	29	12.5
	150/3	4000	35	10.3
Finishing Heald Yearns	30/9	3500	14	22.7
and Coarse Sewings.	50/9	3500	19	16.7
	100/9	3500	26	12.0
	150/9	3500	32	9.8
	16/6	3500	13	24.0
	20/6	3500	14	22.3
	20/9	3200	12	24.0
	30/15	3200	11	26.3
Preparing for Nettings.	20/5	3500	10	31.8
	30/5	3500	12	26.5
	20/15	2800	11	23.2
Finishing Nettings or	30/15	2800	14	18.0
Cords	36/30	1800	11	14.8
	60/30	1800	14	11.6
	36/16	1800	12	13.6

The results given will, of course, vary with the conditions, such as an alteration of the number of turns per inch, or the spindle speed, etc. Another point worthy of notice is that doubled yarns even when intended for similar purposes are not invariably produced with the same twist, as for instance, crape yarn may have twists from $\sqrt{}$ counts x 4.75 to $\sqrt{}$ counts x 7, and cords may have twists from $\sqrt{}$ counts x 8 to $\sqrt{}$ counts x 10. Thus it will be seen that there is no fixed standard, the usual custom being, when ordering doubled yarn, for the customer to specify the number of twists per inch required.

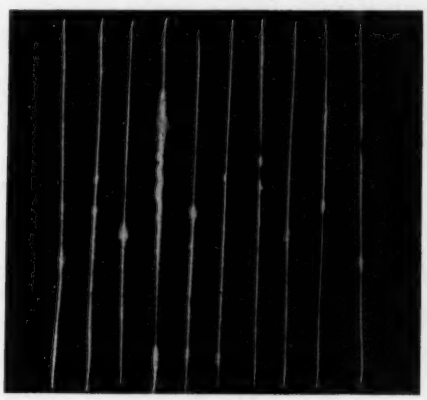
HOW TO ADJUST A SPINNING FRAME.

Editor Cotton:

I would like for you to furnish me information how to level, line, and set the spindles and the rings on a spinning frame. Also, I am sending a sample of bunchy yarn and would like to know how this defect was occasioned. Was this defect caused by long staple cotton being mixed with that of ordinary length, or was it the fault of the rolls? Would you advise plumbing the spindles?

GAFFNEY.

We submitted the above inquiry to a cotton spinner in New England and we give his answer as follows:



BUNCHY YARN.

SPINDLE SETTING.

A ring frame should be levelled both lengthwise and across. In the lengthwise levelling place the spirit level on the roller beam, taking care that the beam is first wiped clean. Try this on both sides and at several points on each side. For levelling across the frame use a straight edge resting on the front rolls at both ends and in the center. This ought to bring the spindles and ring rails to a level. The spindle rail is levelled at the machine shop and pinned in position. The ring rail may be relevelled by raising the studs which support the lift rods.

To line the rings adjust the end rings on each length of rail and stretch a cord between them. Then set the other rings to this cord. To line the spindles put the end ones in position and connect by a cord. Then set the other spindles to the cord. If the rings are in cast iron holders and have considerable room for adjustment it would be easier to line up the spindles first and get the rings in position by centering them with the spindles. If the rings are in a sheet iron holder and have but little room for adjustment it is better to set the spindles to the rings.

In centering spindles and rings use a bobbin with a tight fitting collar just a little smaller than the inside diameter of the ring. This setting is made when the spindles are running. First run the ring rail down to a position near the spindle base and lock there. Then put the bobbin on the first spindle with the collar flush with the upper flange of the ring and move the spindle case about in the spindle rail till the space between spindles collar and ring is the same all around. After all the spindles have been centered in this way run the ring rail up near the top of the spindle and move the collar up on the bobbin till it is again flush with the ring. If the space between the collar and ring is not uniform at this point, slip two or three pieces of paper in between the spindle case and rail on the side where the collar is nearest the ring. Always reset the guide wires after resetting the spindles. The strips of paper plumb the spindle and center the tip without moving the base.

After this the ring rail should be lowered to its first position and all the spindles examined to make sure they are still concentric with the ring.

The sample of yarn enclosed is "cockled" and without doubt the rolls on the frame are too close as there seems to be no long fibers in the sample of roving submitted. The rovings staple 1 1-16 inches and the rolls should be set just a little over this distance. Perhaps the difficulty can be removed by slightly spreading the top rolls. It would also be well to look over the draft gearing and see that none of the gears bind as this will cause the yarn to be uneven. I would advise setting the rolls first and examining the draft gearing before resetting the spindles.

J. P. HUMASON.

THE PROPER SIZE OF TRAVELLER WANTED.

Editor Cotton: Will you kindly give me a formula for finding the size of travellers to be used on the spinning frame? SPINNER.

Round Pointed Twister Square Pointed

TRAVELLERS.

We give below answers from different authorities to whom we submitted this question which we trust will satisfy our inquirer. We also give two tables that have a close relation to the information called for.

There is no formula that has ever been compiled for the reason that hardly any two mills use the same size of traveller for any given number of yarn, as the size or weight of the traveller depends entirely upon the speed of the spindle, the size of the ring, whether or not separators are used and the condition of the stock.

W. R. C.

We know of no formula for finding the size of travellers to be used on spinning frames, it being necessary for each mill to determine this for itself, by trying different sizes, which depend entirely upon the size of the ring, speed of spindle, quality of stock, etc. Hardly any two mills use the same traveller for any specified number of yarn.

C. W. N.

TRAVELLER TABLE.

For Within Ring Spinning Frames With Separators

WARP YARN

Number of Yarn	Revolutions of Spindles	Diameter of Ring	Number of Traveler	Weight of 10 Travelers in Grs.	Number of Yarn	Revolutions of Spindles	Diameter of Ring	Number of Traveler	Weight of 10 Travelers in Grs.
4	4950	2"	14	39	32	9500	1¾"	7-0	5½
6	5900	2	12	33	34	9000	1¾	9-0	5
8	6700	2	9	23	36	9700	1¾	11-0	4½
10	7250	2	8	20	38	9800	1¾	13-0	4
11	7500	2	7	18	40	9700	1⅝	14-0	3¾
12	7750	2	6	16	45	9700	1½	15-0	3½
13	7950	2	6	16	50	9700	1½	16-0	3¼
14	8100	2	5	14	55	9600	1½	16-0	3¼
15	8300	2	4	13	60	9600	1½	17-0	3
16	8450	2	3	12	65	9600	1⅜	17-0	3
17	8600	2	2	11	70	9500	1⅜	18-0	2¾
18	8750	2	1	10	75	9500	1⅜	18-0	2¾
19	8850	2	1-0	9	80	9300	1⅜	19-0	2½
20	8900	2	1½-0	8½	85	9100	1⅜	19-0	2½
21	9050	2	2-0	8	90	9100	1⅜	20-0	2¼
22	9100	2	3-0	7½	95	9000	1⅜	21-0	2
23	9150	2	4-0	7	100	8700	1⅜	22-0	1¾
24	9200	2	5-0	6½	110	8500	1⅜	23-0	1½
28	9500	1¾	6-0	6					

NOTE:—Sizes of Travelers will vary from the above table according to variations in speed, quality of cotton, etc., but the table may serve as a basis to select from.

The higher the speed the lighter the traveler and vice versa varying in proportion of one or two grades of travelers to each

TRAVELLERS.

Comparative Table.

Shaw's Victor Square or Round Pointed	Wilson Round Pointed	Hicks	Shaw and American	National and Chase-Wilson	Weight of 10 Travelers in Grains.
25-0	23-0	20-0	25-0	25-0	1
24-0	22-0	19-0	24-0	24-0	1¼
23-0	21-0	18-0	23-0	23-0	1½
22-0	20-0	17-0	22-0	22-0	1¾
21-0	19-0	16-0	21-0	21-0	2
20-0	18-0	15-0	20-0	20-0	2¼
19-0	17-0	14-0	19-0	19-0	2½
18-0	16-0	13-0	18-0	18-0	2¾
17-0	15-0	12-0	17-0	17-0	3
16-0	14-0	11-0	16-0	16-0	3¼
15-0	13-0	10-0	15-0	15-0	3½
14-0	12-0	9-0	14-0	14-0	3¾
13-0	11-0	8-0	13-0	13-0	4
12-0	10½-0	7-0	12-0	12-0	4¼
11-0	10-0	6-0	11-0	11-0	4½
10-0	9½-0	5½-0	10-0	10-0	4¾
9-0	9-0	5-0	9-0	9-0	5
8-0	8½-0	4½-0	8-0	8-0	5¼
7-0	8-0	4-0	7-0	7-0	5½
6½-0	7½-0	3½-0	6½-0	6½-0	5¾
6-0	7-0	3-0	6-0	6-0	6
5-0	6-0	2½-0	5-0	5-0	6½
4-0	5-0	2-0	4-0	4-0	7
3-0	4-0	1½-0	3-0	3-0	7½
2-0	3-0	1-0	2-0	2-0	8
1½-0	2-0	½-0	1½-0	1½-0	8½
1-0	1-0	1	1-0	1-0	9
1	1	1½	1	1	10

On numbers 2 and heavier the weights are the same.

We do not believe that it is possible to give any information that will tell exactly what size of traveller is required to spin a certain size of yarn owing to the difference in stock used, speed of spindles, diameter of rings and many other things which would enter into the problem.

J. E. H.

There is no formula published for finding the size of ring travellers, such as you ask for. It would be impossible to publish the same owing to the variation in the size of rings.

M. C.

WOOL MANUFACTURING.

BLENDING OF COTTON AND WOOL.

SELECTIONS MUST BE MADE OF BOTH WOOL AND COTTON, OR OF MUNGO. MILLING OR FULLING.

BY JOSEPH H. BARKER.

PART II.

Cotton and cotton waste of almost every kind is now used for blending with wool, the choice being determined by the class or the style of the goods to be manufactured:—Peruvian, Mexican, Texas and other American cotton; the waste from spinning Egyptian, and other cotton waste of almost every description from the spinning mills. All are extensively used in the production of woolen goods of one kind or another; and inasmuch as the numerous varieties of cotton vary very much in length, strength, thickness and waviness or straightness of the fiber, and in luster, color, and elasticity, the selection of that which is most suitable for any given purpose, is a matter of considerable importance.

Peruvian and Brazilian cotton (Gossypium Peruvianum) is especially suitable for mixing with wool, in the manufacture of the highest class of mixed goods, by reason of the length, strength and elastic and wavy or undulating character of its fiber, which more nearly resembles the fiber of wool, in these respects than any other variety; and when the mixing is judiciously and properly accomplished, it is almost impossible to distinguish one from the other—the cotton from the wool.

Some varieties from Texas and Mexico (possibly Gossypium hirsutum) possess in a less degree the same characteristics, and are for that reason, and also by reason of being somewhat lower in price, extensively used for mixing, with wool—in some cases, and with mungo alone in others, for some of the higher classes of goods. But the price of these high class cottons bar their general use in the lower kinds of cloth, and consequently for such goods, cotton waste from good, sound, long cotton, such as Sea Island and Egyptian is mostly used, both in the dyed and in the undyed condition.

The question of cost, however, is not always the determining factor in the selection of the cotton to be used. On the contrary, the cotton is not infrequently the most costly item in the blend, as, for instance, in the case of a blend consisting of mungo at $3.50 to $5.00 per pack (240 lbs.) and of cotton at $25 to $30. or more, per pack. In such a case the cotton selected must necessarily be good, long, and sound, for the purpose of binding and holding the mungo and other waste together, and of giving strength and consistency to the thread, and ultimately to the cloth.

Furthermore there are certain classes or qualities of mungo and waste which could not well be utilized at all, without the use of cotton, for they are of a character altogether so inferior and irregular as to be unfit for use in the production of any cloth in which such valuable material as wool could profitably be used; and inasmuch as it could not be used at all without the admixture of some other longer and stronger fiber, cotton waste is the only available material for blending with it. Cotton (new) would be too costly. From such material dress goods, very "sightly" in appearance are made at prices ranging from five to eight cents per yard.

On the other hand there are numerous woolen goods of such high quality and character, which are at the same time blends of wool and cotton, that only pure fleece wool, and the very highest class of cotton can be used in their production; and it is almost needless to say that there are infinite gradations between these extremes, in which cotton or wool may predominate, and in the preparation of which perfect knowledge of the nature and properties of the raw material, and skill and experience in their manufacture, are absolutely necessary to insure success in their production.

Such goods as blankets, rugs, upholstery cloths, and others, may, for instance, be made entirely of wool or entirely of cotton, or of any conceivable proportions of both, and may also be of any conceivable quality within the range of the qualities of wool and cotton.

From those flannels which are made entirely of wool to flannelettes which are made entirely of cotton—finished in such a way as to look like wool—there are infinite variations and gradations of so-called flannels, in which wool or cotton predominates in a greater or less degree; and very variable in quality; and in woolen cloths for clothing and dress goods the same conditions exist.

In all the instances mentioned, the cotton is sometimes blended with the wool previously to being scribbled and spun. In some cases, pure cotton threads are used for the warp, and all-wool threads, or threads composed of a mixture of wool and cotton, are used for the weft, or, vice versa. In other cases an all-wool, or a mixed thread is twisted with a cotton thread for either the warp of the weft or for both.

To the practical woolen manufacturer it will be obvious that all these varieties of mixture, in quality and proportion of two such different fibers, can not be equally advantageously and successfully operated on the same kind of machinery, and that there must necessarily be modifications and adaptations in the construction and parts to fit it for operating blends in which one or the other fiber predominates; for it is assumed that it is fully understood and appreciated, that woolen machinery which is constructed on the best model for operating wool only, is not adapted for operating cotton, nor is the woolen method of preparation at all suitable for the preparation of cotton, any more than cotton machinery and the methods of preparing cotton for the carding machinery is suitable for oper-

ating and preparing wool. There are certain essential principles which govern the operations in each case that are not applicable to the other, and it is proposed in the following remarks to indicate as briefly as possible what these conditions and changes are, which experience, and study of the subject have up to the present time led to the best results.

In the manufacture of goods consisting of a blend of wool and cotton, there is another very important consideration which should not be overlooked, viz: the selection of the most suitable kind of wool, having regard to the future milling process.

If the goods to be manufactured are to be of the hard-milled description, it is of paramount importance—inasmuch as cotton possesses no felting properties—that wool or woolen material of the very highest felting property should be selected, otherwise it will be impossible to produce a hard-milled cloth.

It must be obvious that in a mixture of wool and cotton the area of contract of the woolen fibers with one another, is necessarily much diminished by the presence of the cotton fibers, and the imbrications on the fibers are prevented from engaging freely with one another to that extent, and felting, which is dependent upon the interlocking of the fibers by their imbrications, is prevented or retarded. Consequently for a hard-milled cloth, the proportion of cotton in the blend must necessarily be limited to such a proportion as will admit of sufficient contact of the woolen fibers with one another as will admit of successful felting.

In the milling process the wool does not felt with or attach itself to the cotton, but, as it were, felts around it, and more or less separates itself from it, and arranges itself upon the surface of the cloth. This remarkable property of wool—that of separating from the cotton—has frequently been observed in mixtures wherein the cotton and the wool were of different colors. In such cases it was seen that the longer the milling was continued, the more the surface of the cloth became of the color of the wool, and the color of the cotton became less and less visible. On cutting the cloth, with a clean precise cut, it was observable that the center of the cloth was more decidedly of the color of the cotton.

It is well known that in such goods as flannels, which are frequently washed, and which have been made from a mixture of cotton with very good felting wool, the oftener they are washed the more woolly they become on the surface, until eventually almost all visible trace of the cotton is lost.

Nothing could more clearly indicate the necessity of utmost care and regularity in the mixing and operating of wool and cotton in combination, inasmuch as milling tends to emphasize rather than regulate or minimize such irregularities as may be due to imperfect mixing.

In the case of yarns which are to be used in the manufacture of goods which are not to be milled—yarns for instance to be used as backing for worsted cloths, for suitings of the lowest type, and for some upholstery and furnishing cloths, etc.,—the above remarks do not apply with so much force, except so far as to the necessity for great care and regularity in the mixing, to the end that regular and even shades may be secured.

During the last ten years the wealth production on the farms of this country has exceeded the fabulous amount of $60,000,000,000.

STRIPPERS AND TRANSFER ROLLS ON CARDS.

The mechanism here shown is applicable to machines for carding or straightening the fibers of wool, cotton, and other similar stock, more particularly wool.

It lies principally in the construction of the card clothing, and in applying it to strippers and transfer rolls on carding machines.

The purpose is to so make the card clothing and to so arrange the rolls that a stripper or transfer roll can be used as a stripper or transfer roll and as a worker at the same time. Its principal purpose is to permit a larger number of workers and therefore a larger number of carding points upon the same main cylinder. By its use it is claimed that a better and stronger sliver is produced, and one in which the fibers are straighter than is usual. By this arrangement it is said that one card will do the work of two or three and the resulting yarn is smoother and has fewer specks.

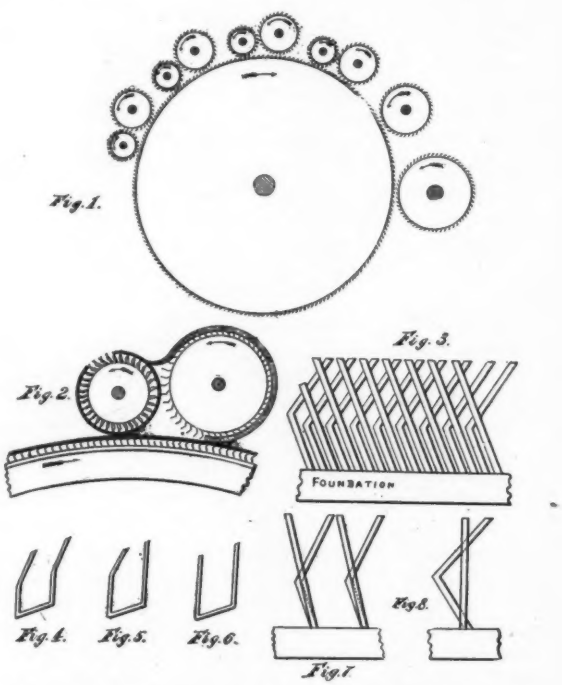


Figure 1 is a diagrammatic side view of a card including the main cylinder, the workers, combination strippers and workers, fancy, and doffer. Fig. 2 shows in detail a single worker with a stripper-worker in connection with the main cylinder and also shows the course of the different webs, part of one web being broken to show the teeth. Fig. 3 is a magnified side view of a strip of card clothing made according to the object of the scheme. Figs. 4, 5 and 6 show different forms of staples. Figs. 7 and 8 show different arrangements of the teeth of the card clothing. Fig. 9 shows in perspective an arrangement of teeth wherein a plurality of rows of straight teeth alternate with a plurality of rows of bent teeth. Fig. 10 shows a similar construction with adjoining single rows of straight teeth and bent teeth. Fig. 11 shows a worker, and a stripper provided with teeth of different pitches in the reversed position from that shown in Fig. 2 and also shows the web partly broken to show the teeth. Fig. 12 shows a pair of workers between which is

a connecting stripper-worker which acts as a transfer roll, and a stripper in front of the first worker.

In the art of carding, where two rolls covered with card clothing travel with their points in close proximity to each other and where one or the other or both carries a web, by different arrangements of the teeth of the card clothing, different results are produced. In one case, carding or straightening of the fibers will occur; in another case one roll will strip the fiber from the teeth of the other roll; and in still another case, the fiber will be brushed off and rolled up between the two.

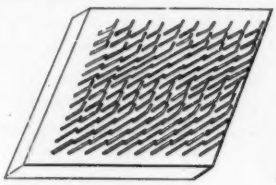


Fig. 9.

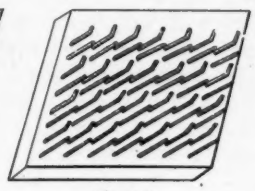


Fig. 10.

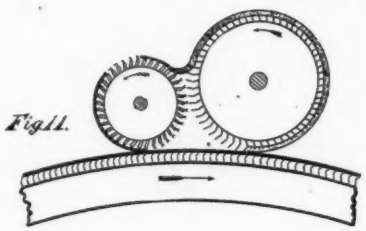


Fig. 11.

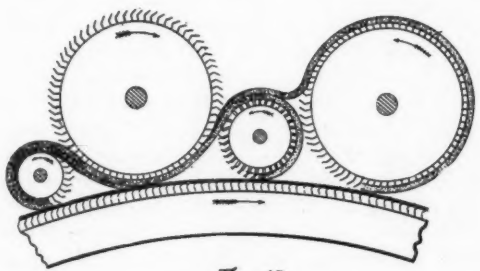


Fig. 12.

The ordinary card clothing has teeth which are bent towards their points at an angle with the radial lines of the cylinder to which they are attached. When clothing with such teeth is run point to point, as a rule, carding will take place. On the other hand, if the teeth are set with their points in the same direction and the cylinders run at different speeds towards the points of the card clothing teeth, the cylinder with the faster surface speed will strip or brush the web from the other. Numerous other combinations are familiar to carders.

In the common form of cards, the main cylinder travels at a very high surface speed, as say one thousand feet a minute, and it is surrounded by a plurality of slow running workers whose teeth are point to point with those on the main cylinder. The surface speed of the workers is say sixteen feet a minute. In front of each worker is a stripper which cleans the stock from the worker and is itself cleaned or stripped by the main cylinder. In such case the card clothing is attached to the stripper in the opposite way from the workers and the main cylinder. Thereby the teeth of the stripper point in the same direction with those on the worker and on the main cylinder and are not point to point therewith. The surface speed of the stripper is say two hundred and fifty feet a minute. No carding takes place between the strippers and the main cylinder in such case, but the carding all takes place between the workers and the main cylinder.

The card clothing as shown in Fig. 3 is made with certain rows or sets of bent teeth of the ordinary construction. These teeth start backward at a reverse angle from the foundation of the card clothing to form a leg and are bent to pitch forward to form another leg. Thereby a sort of hook is formed, the point of which is preferably in advance of its base. The other teeth are straight and pitch backwards substantially in the same direction with the first leg. The rows of straight teeth and of bent teeth may be arranged singly as shown in Fig. 10 or a plurality of rows of straight teeth can alternate with a plurality of rows of bent teeth as shown in Fig. 9.

The card clothing may be made of staples with two bent legs as shown in Fig. 4, which alternate in different combinations with staples having two straight legs as shown in Fig. 6, or staples may be used such as shown in Fig. 5 with one straight leg and one bent leg. With clothing so made, there will be more or less flexibility or give to the teeth.

It is not necessary to be confined to the exact degree of pitch for the teeth as shown in Fig. 3, as the angles between the legs of the straight and the legs of the bent teeth may be varied as shown in Fig. 7, and in fact the straight teeth may stand at right angles to the foundation as shown in Fig. 8.

The preferred form of card is shown in Figs. 1 and 2. The main cylinder travels forward with its teeth pointing forward, and the workers travel backward with their teeth pointing forward. Carding takes place between the workers and main cylinder, and a certain amount of web is carried over and back by the workers in the usual manner. Instead of the ordinary stripper, however, the stripper roll is covered with the combination toothed card clothing.

It will be seen that a carding takes place between the bent teeth of the stripper workers and the teeth of the main cylinder. The straight teeth, on the other hand, have sufficient slant to effectively strip the web from worker carrying it over and back until it again reaches the point of contact with the main cylinder.

Such stripping would take place to some extent without straight teeth, but it would be a brushing or tearing off of flakes and would not be as smooth and perfect. As the stripper travels at a much higher surface speed than worker, it will be seen that the web will be attenuated thereby and that it will be brought in carding contact with the teeth of the main cylinder more frequently than if stripper traveled at a slower speed.

A certain amount of thin web is picked up from main cylinder and is retained on the bent teeth and on the straight teeth of stripper, and this is carried around and merged with the main web until properly carded. The result of using the straight teeth on the stripper is that they strip in a clean and efficient manner the web which is carried over and back by the worker, thus leaving the teeth of worker clean and in good condition to card with the main cylinder. Moreover, the straight teeth hold firmly the thin web which is carried up and back by the stripper.

While the arrangement of rolls shown in Fig. 2 is preferred it is found to be a decided advantage over ordinary

methods to use card clothing on the ordinary stripper (Fig. 11) with its teeth set in the direction opposite to that shown in Fig. 2. In such case the worker is stripped of the web by the bent teeth of the stripper in the ordinary way.

Another arrangement which can be used is to arrange the workers in pairs around the main cylinder. One such pair is shown in Fig. 12. In this arrangement, we have a forward running worker, a backward running worker, a combination stripper-worker or transfer roll between them with its bent teeth arranged to card with the main cylinder and also with the forward worker, and an ordinary stripper provided with bent teeth only which are set to strip the latter worker and not to card with the main cylinder. In this arrangement, the transfer roll acts with reference to the back worker and main cylinder, in a way similar to the stripper in the construction shown in Fig. 2. It cards with main cylinder and strips the back worker.

KNITTING

WHEN IS HOSIERY YARN BAD?

WHAT THE KNITTING PROCESS IS. THE NEEDLE AND ITS STRUCTURE. THE FUNCTIONS OF GUIDES. DROP STITCHES.

BY ERNEST TOMPKINS.

PART I.

Not infrequently a spinner receives complaint about yarn which to him appears to be all right, but on stating his opinion to that effect he is often told that the yarn is bad, it can not be knit and that he must take it back—that is all there is about it. This kind of an answer is exasperating and brings up doubts regarding the good faith of the knitter.

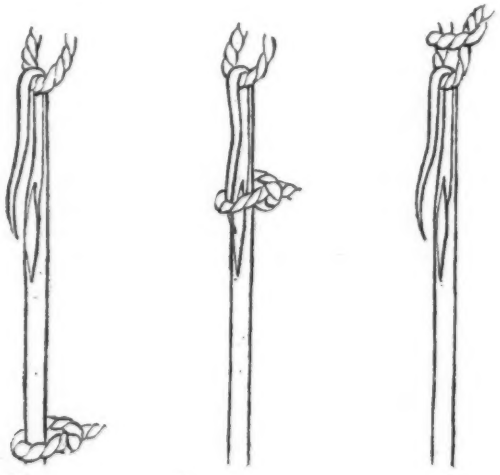


FIG. 1.

The following discussion is intended to make clear some of the difficulties with which the yarn has to contend so that the spinner may be better prepared to meet these difficulties. Some spinners have actually proposed installing knitting machines on which to test the yarn which might be pronounced faulty, and undoubtedly some spinners have started in the knitting business partially with the idea of demonstrating to their own satisfaction whether their yarn was really good or bad. But either installing an experimental machine or experimenting on a commercial scale would be only a partial help out of the difficulty, as the conditions to be duplicated are many, so many that it would be out of the question to make the duplication.

In order to treat this subject briefly it will be well to confine the discussion to cotton yarns, say carded peeler in numbers ranging from 14s to 30s, for circular loop-wheel knitting machinery.

The yarn is generally delivered to the knitting mill on cops or cones. Sometimes the knitting is done from the cones without rewinding, but generally the cones are rewound and the cops always are.

Re-winding is a topic by itself and much attention has been given to it with the development of coners for knitting yarns. The scope of this article does not include winding so this will be passed over simply with the observation that the yarn should be strong enough to make it possible to wind a bobbin sufficiently hard to prevent pull-ups; that is, the delivery to the knitting machine of more than one coil of yarn at a time. Most of the hosiery winding is undoubtedly still done on winders of the Payne type in which the solidity of the bobbin depends on the tension on the yarn. If the yarn can not stand sufficient tension to build a solid bobbin one or more extra coils may be delivered to the machine at once, or the package may be so soft that the yarn will draw into it during the winding with the result that it will not deliver freely to the knitting machine, thus causing trouble which will be mentioned hereafter.

In order to explain intelligently the difficulties with which the yarn has to contend in the knitting operation the latter should be explained briefly. As is generally known, hand knitting consists of forming a series of loops on a round rod and then forming a new series by drawing the yarn through the first formed loops with another rod. In other words, the knitting operation consists essentially of making a fabric by drawing new loops through a series of previously formed loops. No practical machine has been produced that will draw the loops through with a straight rod as is done in hand knitting. The machines use a hook which is pushed through the previously formed loop, hooks the new yarn and is then withdrawn bringing the new yarn with it, the hook being closed during withdrawal by one method or another according to the kind of needle used. The latch needle hook is closed by a little hinge or latch which swings over the hook as the needle is being withdrawn through the previously formed stitch. The spring beard needle, as its name indicates, has a spring hook the point of which is pressed into a groove in the shank as the needle is withdrawn through the previously formed stitch.

Fig. 1 illustrates three important stages in the formation of a stitch with a spring needle.

Needle 3 has a stitch placed on it as is necessary in starting to knit. This stitch may be the last of the loops

left on the machine, or when starting a new machine it may be a stitch near the edge of a piece of cloth which is hooked onto the needles just for the purpose of making the start. In New York State hooking on this piece of cloth is called "putting on the quarter." The piece of cloth used is sometimes called the "header," probably because it heads the knitting which is to follow.

These stitches after being placed on the needles are pushed down on the shanks so that they are well away from the beards. A new loop of yarn is then passed up under the beard to the head of the needle. Needle 1 shows the original stitch low down on the needle shank and the new loop up under the beard.

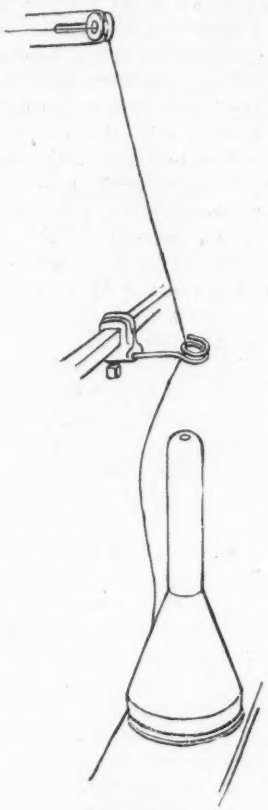


FIG. 2.

The needle beard is next pressed down into the eye so that the point is out of the way of the original stitch, which latter is brought up over it and off of the head of the needle thus forming a stitch from the loop of new yarn, as illustrated by needle 3. It will be noticed that the new stitch now becomes an old one as the operation was started with needle 3. This stitch in its turn is pushed down on the needle shank and the operations are repeated.

The presser which holds down the needle beard is not illustrated as it would hide the up-coming stitch.

There are a few points of interest to be noted in this connection. The stitches are moved up and down on the needle instead of the needle being moved in the stitches. The latter is the case with the latch needle generally. However, as motion is relative it matters not whether the needle or the stitch is moved so far as the principles of the operations are concerned. But it should be remembered that ordinary spring-needle knitting is generally done by moving the stitches on the needles. This motion is obtained by two classes of devices, one class being termed push downs, the function of which is to push the cloth down on the needle shanks so that the new stitches may be put up under the beards. These devices are either wheels or stationary cams. The other class includes the burs. These are angular bladed wheels which mesh with the needles and raise the yarn or the stitches upward on the needles. The pressers are an auxiliary class by themselves, their use being merely to close the beards at the right time. The needles, push downs, the burs and the pressers constitute the elements of spring-needle knitting.

Before leaving the needle its structure should be noted. The groove for hiding the point of the beard is called the "eye." It is a blind eye because it does not extend through the shank. The opening over the eye and under the beard is called the cramp or crimp. It is customary to have this opening sufficiently narrow to pinch the yarn slightly so that the new loops will not drop out from under the beards before the points of the beards are closed into the eye.

It should be noted also that not only must the stitch be of sufficient circumference to pass around the needle but that a little greater circumference is desirable as it has to pass over the hump of the beard and also over the head of the needle and the new loop together.

Fig. 2 illustrates the course of the yarn from the knitter bobbin up to the outer end of the thread guide. In this drawing the bobbin is placed on a bobbin board or rack with the upper end of the barrel about five and one half inches below the thread eye which keeps the yarn off of the edge of the knitter table as well as controls the yarn so that it throws well away from the bobbin barrel. In some cases the bobbins are placed on a platform about level with the table top, in which case the thread eye is higher than the thread guide so that the yarn passes from the bobbin up to the thread eye and then down to the guide.

Yarn that is inclined to kink is prone to do so between the bobbin and the eye in the end of the guide. Unless the yarn is extremely hard twisted there is comparatively little danger of this kinking when the machine is in operation, as the tension due to the speed of the yarn is generally sufficient to prevent kinking. However, when the machine stops it is not infrequent for a number of kinks to form. These are not likely to make trouble in the space illustrated in Fig. 2. The trouble is caused farther on.

Before leaving this drawing, attention should be called to the fact that the yarn lies in coils on the conical surfaces of the bobbin. These coils are helical; that is, they circle on the coiled surface upward to the barrel and then downward to the cylindrical portion. The distance between successive coils on the surface is made as great as is convenient so that one coil will not cut under previously laid coils nor pick up adjoining ones as it runs off. However, if the yarn contains splinters or bur barbs these may hold or hook a leaving coil making so much tension that one or more extra coils are picked up at the same time or the yarn is pulled so much that it is broken or damage is transmitted to the needles, as will be explained later. If a number of coils are picked up they will probably pass through the thread eye. They may clog at the outer end of the guide breaking either the yarn or needles, or they may pass along further with results which will be explained further on.

Fig. 3 shows the thread guide, sinker bur and needles, illustrating the space traversed by the yarn after it enters the outer eye of the guide and up to the place where it enters the needles.

The bur blades have small projections at the lower portion called nibs, which catch the yarn and hold it as it is being forced up between the needles. In the drawing the needles move in a circle from left to right, which would make them recede from the reader, where they enter the bur. Consequently, the bur, being driven by the needles, revolves from right to left and the blades which catch the yarn are also receding from the reader.

It will be noticed that the yarn enters the needles just below the points of the beards and the bur blades do not project very far below that. In other words, the entrance for the yarn is quite narrow. It might be increased by increasing the diameter of the bur but there are objections to this; consequently, it is desirable to control the yarn at the inner end of the guide within narrow limits. If the yarn were perfectly pliable and contained no bunches, knots nor foreign matter, the problem would be simple. Commercial yarn however, is not perfect, consequently much effort has been expended in devising guides which would insure the proper delivery of the yarn to the needles. If the yarn rolls up on the swell of the blades it may get over the needle beards so that when the old stitches are cast off there is no new yarn to hold them and the cloth goes clear of the needles until the yarn catches under the beards again, which it will generally do unless the guide is far too high. If the yarn drops down off of the nibs the same result occurs; that is, the fabric leaves the needles until the yarn is again picked up by the nibs and forced under the beards. Also, if the guide is too low the yarn may not be picked up and the fabric leaves the needles all the way around the cylinder.

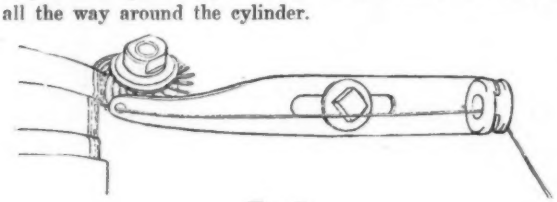


FIG. 3.

Obviously then, the placing of the guide is dictated by a choice between two extremes, and the smaller the bur the finer is the choice. Suppose, however, that the yarn has a hard twist or for other cause it resists bending. Then as the blade starts to crowd it between the needles it fails to take a sharp bend and throws out of position, generally downward, so that it gets off of the nib, as explained above, allowing the cloth to leave the needles or needle. If it leaves only one needle the defect in the fabric is called a "drop stitch." If the yarn is smooth the next stitch above may drop and so on in succession making a vertical line of open work in the cloth. This is called a "run down,"—although on the machine in question it really runs up,—and with mercerized yarn it may run as far as the take-up after which it can run no farther because the cloth is rolled there and the friction of the roller holds the stitches in place.

Drop stitches are a serious cause of waste in spring needle knitting. They may be caused by the yarn dropping out from under the beards after the sinker bur has placed it in position, but when caused in that way they may be overcome by a properly-crimped needle or by the use of a stationary presser which closes the beard before the yarn has a chance to get out, so that drop stitches caused in this way may be surely overcome by a slight modification of the machine, and, therefore, can not justly be charged to imperfect yarn. On the other hand drop stitches caused by the twisting of the yarn as it enters the needles may be remedied in the present state of the art by such methods as adjusting the guide more carefully in any direction that may be necessary, by reducing the diameter of the hole in the guide, by increasing the nib on the bur, by increasing the diameter of the bur, by decreasing the length of the beard, or by putting tension on the yarn. But many of these changes may bring about undesirable results which would limit or prohibit the change; for instance, if the hole is made too small, knots and bunches would not pass through it and in any case the passage of a certain number of knots and bunches must be provided for. If the nib is increased too much it will pull the yarn instead of letting go of it after it is in the heads of the needles making what is called a "pull out," which is not allowable in good knitting. If too much tension is put on the yarn the sinker bur will be dragged back so that it over-reaches and smashes the needles or the latter will be sprung back out of line as the yarn enters making tight stitches which will break before they are cast off. Consequently, the yarn may be so wiry that it is impractical to knit it because it can not be sufficiently constrained to get it under the needle beards. It would take a book to illustrate and describe even briefly the different tensions, guards, tips and other devices which have been used to help bridge this small but troublesome space between the inner end of the guide and a secure position under the needle beards.

AUTOMATIC MACHINE FOR KNITTING STOCKINGS.

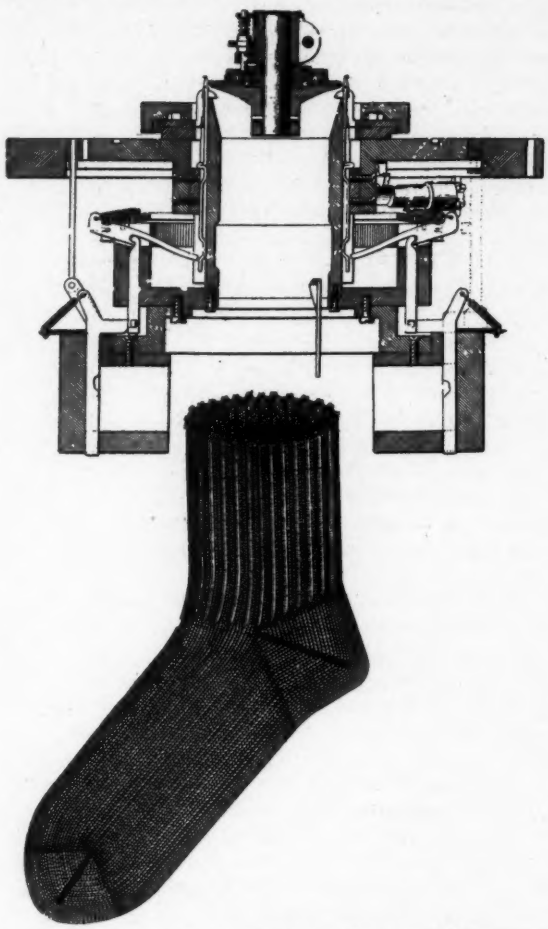
The mechanism partially shown herewith has for its object the production of an automatic knitting machine primarily designed for the knitting of stockings.

The machine enables the complete article to be knit from one end to the other entirely automatically, so that all that is required is to keep the machine supplied with the proper yarns, to separate the stockings which come from the machine in a continuous web, and then to perform such simple operations as the stitching or looping together of the opening left at the toe end.

The present invention it is believed combines in a single automatic machine all the various features necessary to make a commercial stocking with the ribbed leg with reinforced toe and heel portions of proper and proportionate weight throughout and of sightly appearance when finished and when worn.

The machine is adapted to make a stocking as here illustrated. The stocking is, save for the necessary closing seam of the toe, knit in one seamless web, with the toe, foot and heel portions formed of plain knitting, and the leg portion of ribbed knitting. Since in forming the ribbed leg more stitches are made in a course than are made in forming the plain circular portion of the foot, it will be seen, that unless provisions were made to compensate for the increased number of stitches thus formed the ribbed leg would be too large and unsightly. The leg portion of the stocking is accordingly formed of a thread sufficiently finer than that used in the foot portion to compensate for the increased number of stitches, and the object is a seamless

stocking in which the foot portion is knit in plain stitch, the leg portion in rib stitch, and with the relative weights of the yarn in the ribbed leg and the plain foot in inverse ratio or proportion to the number of stitches in the ribbed leg and plain foot portions.



The machine of the present invention comprises among others the following features which will enable it to respond to the requirements for the production of not only such stockings as above described, but also stockings and other work of varied character and construction. Two sets of knitting needles, the one for the production of plain circular work and reciprocating work, the two combined for the production of ribbed work, and means for controlling the separate and conjoint operation of the sets of needles, all from pattern mechanism, so that either plain circular, reciprocating, narrowing and widening, or ribbed knitting may be performed upon the machine during such periods as may be predetermined. Web holders or sinkers for the set of needles for performing the plain and reciprocating work over which the thread is at times measured off, and which serve to hold down the knitted web especially during plain knitting. Take-up mechanism supported by the knitted web, additional weights for the take-up mechanism to increase its taking up effect, and means for automatically applying either the take-up mechanism, or weights to the take-up mechanism, or the take-up mechanism and the weights. Auxiliary take-up mechanism or grab mechanism for meeting the requirements occasioned in the taking up of the knitted web due to the occurrence of pouches, such as formed in knitting the heel and toe, and means for automatically putting the auxiliary take-up mechanism into operation. Thread supplying mechanism with provisions for automatically changing, adding or omitting threads of desired weight or quality, whereby desired portions of the stocking may be reinforced or formed of thread of different character or quality. Mechanism for automatically controlling the length of the stitch and hence the elasticity or tension of the knitted web, whereby the shape of the stocking may be controlled. Mechanism for automatically changing the speed of the knitting machine to accommodate it to the character of knitting being performed thereon. These and other features result in the production of a wide range and character of work.

In the machine the work is preferably commenced at the toe pouch. The active set of needles in narrowing and widening are supplied with a coarse thread, the machine running at a comparatively slow speed as required in reciprocating work.

Upon the completion of the toe pouch the thread is changed to a finer quality, and the plain foot portion knit in complete circular courses, the speed of the machine being increased at the same time to a higher speed.

When the heel pouch is reached the speed of the machine is decreased, a change of yarn effected, and a heel pouch formed in the usual way by narrowing and widening. On completion of the heel pouch the plain circular knitting is resumed at high speed and a change of thread made, if desired, to constitute an ankle portion, if a plain ankle portion is desired.

If the ribbed leg is to be formed directly on completion of the heel pouch then the dial needles are thrown into action, a change to a finer thread effected, the speed of the machine increased, and the size of the stitch adjusted to produce a ribbed leg of the requisite elasticity and weight.

The entire operation throughout is automatic and continuous, and in fact upon the completion of the stocking the change is automatically effected to plain circular web to form a short connecting web between the end of one stocking and the toe of the succeeding stocking, so that the stockings are knit in one continuous web.

The illustration is an enlarged vertical section of the machine showing the stationary needle-cylinder, its needles, the cam-cylinder, devices for moving the needles into or out of position for toe or heel work, the dial-needle bed and the dial cam plate with its locking device and part of the grab.

Nowhere in Germany is the cotton industry better organized than at Mulhausen, and this place has become noted for its fine muslins and print goods.

Twilled serges and crapy serges are easily manufactured from cross-bred wool, but when worn as garments their tendency to crease and to shine has not hitherto been overcome.

Comparatively few of the German mills have both spindles and looms, and in the big centres the mills specialize on either spinning or weaving, as is the custom in England.

The use of oil for lubricating wool is imperative, as only by its use can the fibers be made to work smoothly during combing, etc.; but beyond serving its purpose here the user should know how the oil will affect after processes.

DYEING, BLEACHING AND FINISHING

A CASE OF BLEACHING.

An interesting case has been decided in the court of Common Pleas, of Lehigh County, Pa., of the Lund and Roeth Co., of Catasaqua, Pa., manufacturers of narrow ribbons, against Pickup and Kean, of Allentown, Pa., dyers and bleachers of cotton yarns.

In the spring of 1907 the plaintiff had some cotton yarn bleached by the defendants and subsequently wove the yarn with raw silk in the manufacture of narrow ribbons. The ribbons were sent to a dyer to be boiled off and dyed. They were then returned to the mill and finished. About six months after the ribbons had been sold the purchasers complained that they were "rotten" that is, had lost in strength. The manufacturer had the ribbon analyzed by a firm of general chemists in New York City and the chemist reported having found 1.31 per cent. chlorine in the ribbon. Thereupon suit was brought against the bleacher, the plaintiff claiming unskillfulness and the presence of chlorine in the goods. In view of the claim made by the plaintiff the case depended largely on the testimony of the chemists. Mr. Bailey, representing the firm who had analyzed the ribbon testifies to the amount of chlorine but was unable to state in what form the chlorine was present in the goods. He had determined the chlorine by means of silver nitrate.

Dr. Frederic Dannerth, textile expert and chemist for the defense was the last witness called. He testified that he had found chlorine in the ribbon and that he had found it in the form of chlorides. No free chlorine could be found in the ribbon. He also had determined the chlorine by means of silver nitrate. During the direct examination he explained the difference between free chlorine and chlorine present as chlorides (common salt), and also explained the chemical nature of bleaching powder. His testimony consumed almost forty minutes and apparently made an impression on the large number of manufacturers and the jury present at the hearing. The verdict was in favor of the defendants. Both sides had summoned a large number of out-of-town witnesses.

LUSTER AND SCROOP IN WOOL YARN.

It has been a common practice for several years to impart to undyed cotton yarns a silky luster and handle by means of mercerization, and, of late, success has attended the frequent efforts made to secure a similar result with wool yarn. The oldest known process is to chlorinate the wool, but as it gives the wool a yellowish tinge it makes the fiber unsuitable for any subsequent dyeing with light shades, although it is of small importance in dyeing medium or dark colors. The process is evidently quite out of court when the wool is not to be dyed, in which case the buyer expects a good white in addition to the silklike handle.

The chlorinating process is still by far the best for "silking" the wool, and the drawback above noted can be got rid of by a subsequent treatment with bisulphite, which removes the yellowish color. The complete lustering and bleaching requires three baths:

The first bath consists of from five to ten grammes of concentrated sulphuric acid per liter. The wool is worked in this for from fifteen to thirty minutes at the ordinary temperature, wrung or centrifuged, and put into the next bath without rinsing.

This bath is a clear solution of bleaching powder, containing from five to fifteen grammes of bleaching powder per liter of water. The wool is worked in this for from twenty to thirty minutes at fifty degrees C. After rinsing the wool will be a pure white, and will have the luster but not the scroop. To obtain this it undergoes a further treatment in two baths. The first contains from five to ten grammes of Marseilles or oleine soap per liter of water, and is used at about fifty degrees C. for from twenty to thirty minutes. The wool is then wrung but not rinsed, and entered into the second bath which consists of a solution of from five to ten grammes of concentrated sulphuric acid per liter of water. After from fifteen to twenty minutes in this, the wool is very thoroughly rinsed and dried.

If the wool is to be dyed, any dye fast to soaping and dilute acid can be added to the scrooping baths, so that the scroop and color are given in one and the same operation. Care, however, must then be taken to keep down the temperature and to hasten the process as much as possible, or the luster and scroop will both suffer. The best plan, however, is to dye after lustering and before scrooping.

Unless some care is taken with the bleaching powder bath, the yellow color will not be uniform, and the darker places will be difficult to get rid of in the bisulphite bath. If they occur the goods should pass through baths Nos. 1 and 2 again, as the dark places if left will make any subsequent dyeing unlevel. It is a good plan to add a little hydrosulphite to the first rinse on leaving the bleaching powder bath, so as to get rid of the chlorine more quickly and with less water.

Another process is to prepare a bath by dissolving 480 grammes of soap in forty liters of water and then adding three liters of sodium hydrosulphite solution at twelve degrees Tw. The woolen yarn is worked one hour in this, centrifuged and soured in a cold bath containing from five to ten grammes of sulphuric acid per liter of water. The goods are then completely rinsed and dried.—*Dyer and Calico Printer.*

MERCERIZING.

According to a foreign invention of a mercerizing machine the cloth treated with the mercerizing liquid is passed through a stretching device until the full effect of the lye has been obtained. The most suitable type of stretching device is that in which each edge of the cloth passes over a roller and is gripped between a wheel and a traveling belt. The two rollers are placed opposite each other and at the opposite edges of the cloth, and are capable of being adjusted in planes which are divergent in the direction of travel of the cloth so that the cloth is stretched during its traverse. The cloth is then transferred to another similar stretching device, but in this case it passes beneath the rollers. During the passage through the machine the lye is washed out of the cloth, or its strength is reduced so as to render it inactive. The water is applied hot in fine high pressure jets above the cloth. The gripping bands which pass around the holders are made of

india-rubber with a cloth insertion. Each is formed with a bead on or about the inner surface of that edge which runs in contact with a roller. The rollers also have grooves corresponding to the beads, so that the edges of the cloth are gripped by the bead and forced into and nipped between the grooves, with the result that an extremely tight hold is obtained. A second bead or groove may be formed in the rim of each roller, closely adjacent to, but on the inner side of, the bead groove. The second groove serves to retain acid for the purposes of neutralizing the caustic soda in the edges of the cloth, which are not subjected to the treatment of the jet of water. The acid is supplied to the grooves through fine tubes, and the supply can easily be regulated.

FINISHES FOR COTTON GOODS.

Mattress tickings in some cases require a full but comparatively hard finish, in other cases a full but soft finish is wanted.

The following finishes are suggested:

1. Back Finish:
   10 gallons water
   45 lbs. dextrine
   3½ lbs. monopole soap

2. Back Finish:
   10 gallons water
   30 lbs. dextrine
   15 lbs. epsom salt
   3½ lbs. monopole soap

3. Luster Finish
   10 gallons of water
   7½ lbs. starch
   5 lbs. syrup
   3 ozs. cocoa-nut fat
   1 lb. monopole soap

4. Hosiery Finish:
   10 gallons water
   20 lbs. dextrine
   15 lbs. epsom salt
   5 lbs. syrup
   1 lb. monopole soap

The preparation of the finishes is carried out in this way: Dissolve the starch, epsom salt and syrup separately (the starch must be boiled for a sufficiently long time to become soluble), or dissolve the epsom salt and syrup together and gradually add the starch which has previously been dissolved by boiling up with water. The monopole soap is melted together with the tallow or cocoa-nut fat or paraffine in double the amount of water by means of direct steam, then dilute with a large quantity of warm water and add this weak solution to the otherwise ready finish whilst constantly stirring.

The object of finishing cotton linings is to give them the necessary solidity in addition to a sufficient softness. With dyed cloth, especially black, care must be taken that the finish penetrates the material well so that the backs remain clear and consequently the colors bright. In most cases a low cost for such a finish is of chief consideration. This involves that for such requirements potato or wheat flour, sometimes in combination with China clay or also epsom salt is mostly used. As finishing fats, softenings, cocoa-nut fat and tallow are also employed. Monopole soap used alone or in combination with the above-mentioned fats is only recommendable in cases where a specially soft and supple handle has to be applied to the cloth. Seeing that in particular with linings the qualities are rather varying and that the effect of the finish with these goods is much dependent on the mechanical treatment it is quite impossible to work out directions or recipes suitable for all requirements generally. It is on the other hand necessary to consider in every individual case whether and to what extent an addition of Monopole soap is recommendable.

For certain purposes recipe No. I, for others No. II might be more useful.

I.

50 parts potato flour
50 parts epsom salt
3—7 parts monopole soap
or
3—4 parts monopole soap and
2 parts cocoa-nut fat

II.

50 parts wheat starch
50 parts potato starch
10—15 parts China clay
3—7 parts monopole soap
or
3—4 parts monopole soap and
2 parts cocoa-nut fat.
per 1,000 parts finishing paste

First dissolve the starch by boiling well then add the salt and finally the monopole soap together with the other fats if at all employed. The monopole soap is dissolved with direct steam in a small quantity of water, but before adding it to the finish, dilute the dissolved soap with as much water as possible in order that this weak soap solution may finely and uniformly divide the fatty matter and thus render the size particularly stable. The dissolving of a little dextrine (4—5 oz. dextrine per 1 lb. of soap) together with the monopole soap will be found advantageous. Cocoa-nut fat, softening, etc., is dissolved together with the monopole soap.

It is not necessary to boil the finish again after the addition of the soap, although a boiling is not detrimental. The temperature of the size ready for use should be 95—115° F.

DYEING COTTON GOODS WITH WOOLEN THREADS.

Cotton goods containing differently colored wool effect threads have heretofore been dyed only by complicated methods. It has now been discovered that excellent effects can be obtained if the material consisting of cotton and wool is subjected to a preliminary treatment with formaldehyde and tannin, and then dyed in a cold or lukewarm bath with sulphid colors. When proceeding in this manner the coloring matter is absorbed by the cotton only, the wool remaining colorless; the latter may then be dyed with acid colors to any desired shade.

The method of working is illustrated by the following example: Treat the material which should be well washed and may also be mercerized for one hour in a boiling hot bath containing 20 to 25 grammes formaldehyde and 2 to 5 grains tannic acid per liter of water, then rinse and dye in a cold or lukewarm dye bath prepared with the necessary sulphid color which has been dissolved with the addition of sodium sulphid and glucose. Prepare for instance a liquor with 20-30 grammes immedial black NNG

conc. (katigen black, sulphur black, etc.), 20-30 grams sodium sulphid crystals, 40-60 grams glucose, 2 grams soda ash, 2 grams Turkey-red oil, 5-20 grams glauber salt, 1 liter water, boil for about 10 minutes and allow to cool to 20-40° C. Dye at this temperature for about ½ hour, squeeze well and rinse thoroughly.

COAL TAR AND ANILINE DYES.

Coal tar, as the raw material from which are obtained creosoting oils, aniline dyes, and innumerable organic chemical compounds and medicinal preparations, is of much more economic importance in some European countries than in the United States.

In a report just published by the United States Geological Survey as an advance chapter from "Mineral Resources of the United States, Calendar Year 1907," E. W. Parker, the chief statistician of the Survey, says:

"This country is considerably in the rear, particularly when compared with Germany, in the development of chemical industries based on coal tar, the products of which are imported into the United States to the value of several million dollars every year. At the present time coal-tar manufacture in the United States is confined principally to the production of creosote and of tars and tar pitches suitable for roofing papers, paving materials, and like products. With the continued development of the retort-oven coking industry, however, and an assured supply of coal tar, there is every reason to believe that chemical industries dependent on tar as a raw material will be established The lack of such a use for one of the principal by-products of retort-oven coke manufacture is one reason why the construction of by-product oven plants has not been more energetically pushed in this country."

PRESERVATION OF HYDROGEN PEROXIDE.

A German patent protects a method invented by Dr. J. Arnots for enabling solutions of hydrogen peroxide to be kept without losing strength. It is well known that the commercial product, especially in its more diluted forms, decomposes rapidly on keeping, unless the weather is exceptionally cold. Many acids have been tried as preservative additions to the solution, with more or less success. It is claimed in the patent that tannic acid is a better preservative than any acid as yet tried. A three per cent. solution of peroxide of hydrogen mixed with less than one per cent. of its volume of the concentrated vegetable extract showed practically no weakening after six winter months. The amount of tannin to be added depends naturally on the season and on the time that the peroxide has to be kept.

PROCESS FOR FIXING COLORS.

As is known, the shades on cotton of substantive coloring matters (with the exception of sulphur dyes and vat-dyes) show the disadvantage of being not sufficiently fast against water and washing. It has been discovered that the fastness against water and washing of such shades is very much improved by treating the dyed goods with magnesium salts, stannates (preparing salts) and alkaline agents.

The following example may serve to illustrate, the parts being by weight: 100 parts of cotton are dyed in the usual way with 4 parts of benzofastscarlet 4BS, 10 parts of glauber's salt and 2 parts of sodium carbonate and the dyed cotton is then placed for several hours into a bath (heated to 50° C.) which contains 150 grains of $MgSO_4$ in one liter. The goods are centrifugated and placed, without rinsing, into a fresh bath containing in one liter 15 cubic centimeters of NaOH 34° Be and 1½ grams of sodium stannate (preparing salt), let the goods lie in this bath for some minutes, rinse and dry. The goods might also be treated first with the sodium stannate alkali solution and afterwards with the sulphate of magnesium solution. Neither the magnesium salt alone nor the stannate alone have any effect as far as increased fastness is concerned. The combined use of these chemicals is necessary to bring about the desired effect, but the application of the chemicals must be carried out in separate baths.

Other substantive coloring-matters, such as benzopurpurine, benzofastorange, benzofastblue, etc., other magnesium salts, other stannates and other alkalies or alkaline agents may be used.

THEORY OF DYEING.

From a series of determinations of the amounts of dyestuff taken up by wool in dyeing with a number of acid dyestuffs of homologous or analogous series with addition of sulphuric acid, it is shown that the amounts are proportional to the molecular weights of the dyestuffs, if the same conditions be observed. This result holds good if the amount of dyestuff used be varied from 6¼ to 50 per cent. of the weight of the wool. The amount of water used can be varied between fairly large limits without affecting the quantitative results; this is contrary to the "solution theory." The solubility of the dyestuff in water also appears to be without influence. The sulphuric acid used must do more than simply liberate the free color acid, for, if the dyeing be effected with two per cent. of the free color acid of "Crystal Ponceau," without addition of another acid, the bath will not be nearly exhausted, whilst, in presence of sulphuric acid, exhaustion is nearly complete. These facts are greatly in favor of a "chemical theory" of dyeing.—*E. Knecht.*

HAND TREADLE LOOM.

This is the kind of loom used in Leeds, (Eng.) and district, and also in the West Riding of Yorkshire in the weaving of cloth in the workmen's homes before the factory and machine period. It is still employed in certain mills in the fancy tweed districts for pattern weaving, on account of its simplicity of construction and the readiness with which changes may be made in the coloring and structure of the fabric.

One of the first to exercise inventive faculty in the improvement of the loom was John Kay, born at Bury, in Lancashire, in 1704. He invented the "fly" shuttle, or method of driving the shuttle across the warp. Prior to 1733, the date of this invention, the shuttle was driven by hand from selvage to selvage of the piece.

The weaving community of the West Riding, with proverbial acuteness, immediately perceived the advantages to be derived from the use of the invention, but no benefit accrued to the inventor. An association called the "Shuttle Club" was formed to enable the weavers "to cover each other's costs when prosecuted." After much persecution, Kay left Leeds in 1745, handing over certain of his spinning inventions to the workhouses of Leeds and Birstall.

COTTON is the leading textile paper in the South.

MARKET REVIEWS.

KNIT GOODS MARKET.

The knit goods market has shown considerable improvement during the last month, especially in hosiery. Lines of staple hosiery for fall are receiving quite general attention on the part of buyers, and the way that purchases are made seems to indicate a confidence that values will be sustained during the remainder of the season. Those that are on the road write to their principals that customers are taking hold more readily and seem better disposed to giving attention to what may be said with the result that orders are given more freely. There has been a marked inquiry for staples and fleeced goods for fall trade, and a considerable amount of goods is going into the distributing trade. Duplicate orders are coming in, in greater volume for spring goods, while for the heavier weights the initial business is quite satisfactory. Little complaint can be had with the situation, save that prices are extremely low and leave but a small margin for profit. Colored hosiery for men's wear is in active demand, and some of the mills that are manufacturing this class of goods say that they will not be able to meet the demand for solid colors particularly those in delicate shades. The inquiries for tan hosiery are numerous. Buyers seem to realize that the demand for fancies in solid colors is likely to continue, and that prospects favor an increase in the price, which has already taken place in many instances. It is the general consensus of the trade that this will be a thoroughly fancy season, and that mills that can get out the right kind of goods of this character are pretty sure of a profit. Sweaters are being sold for next fall delivery, preference being given to the better quality of wool goods by the Western trade, and a good substantial business has already been booked. One thing is quite evident, that is, the distributive trade is very bare of stock.

Reports from the Mohawk Valley, New York, indicates that buyers in New York, Chicago, and other large centers are placing orders as far ahead as next fall, on all lines, and that confidence seems at last to be restored among jobbers and retailers. Some of the mills in eastern Massachusetts and Rhode Island state that for the last three months business with them has been the best in their history, and that the amount of work on hand is far in excess of that of a year ago, and is sufficient to keep productive machinery in operation for a considerable period in the future.

THE COTTON YARN MARKET.

The market for cotton yarns, and, in fact, piece goods of all kinds, has been during the holiday season remarkably dull and prices have sagged off much more than were anticipated. A number of the consumers have been running slack or have been entirely shut down, while the mills have been running full, and others, who have been resuming, have added other stock to the large accumulation on hand. A great many of the dealers have a large stock on hand, and have yarn coming in at prices which are below the market. This they have been anxious to dispose of, and in their anxiety to get orders, have depressed prices far below what the mills were willing to accept.

20/2 ply warps. These the mills were asking 21 cents for a month ago, and are now freely offered at 18 cents, and some of the trade state that they have been able to purchase their wants at 17½ cents.

20/2 ply skein. This is being sold under 18 cents.

16/2 ply. This is being sold at 16 cents (carpet stock).

12/2 ply skeins. This is being sold at 15 cents.

8/3 ply. This is being sold at 14 cents.

30/2 ply. This is offered at 19½ cents for skein, and 20 cents for warps.

While conditions are somewhat improved, the consumers of cotton are not getting orders at prices which would show any profit at the prices which the mills ask for yarn, and in many lines where yarn is consumed, the manufacturers state they have no orders whatever.

The advance in cotton had absolutely no effect on the prices of yarn; in fact, it is exactly the opposite of a month or two ago when cotton was easing off in price and yarns advanced. Now we have the paradox of yarns declining and cotton strengthening. Everything points to a good business a little later on.

On hosiery yarns, the conditions have been rather unsatisfactory, and a great many mills will now need orders, who thought they were sold overhead, but had delivieries held up, and who are now pressing for orders.

10/1 cones have been selling at 16 cents.

SOUTHERN SINGLE SKEINS.

4s to 8s	15	@15½	22s	18	
10s to 12s	15½	@16	26s	18	@19
14s to 16s	16½	@17	30s	20	@21
20s	17½	@18			

SOUTHERN TWO-PLY SKEINS.

4s to 8s	15	@15	30s	20	@20¼
10s to 12s	15½	@16	36s	23	@24
14s	16		40s	24	@25
16s	16½		50s	30	@31
20s	18		60s	29	@30
24s	18½		3-ply 8s upholstery	16	
26s	19		4-ply 9s upholstery	16	

SOUTHERN SINGLE WARPS.

8s to 10s	15½		22s	17½	
12s	16		26s	19	
14s	16	@16½	30s	20½	
16s	17		40s	25	
20s	17½				

SOUTHERN TWO-PLY WARPS, ETC.

8s to 10s	15½	@16	26s	19½	
12s to 14s	16½		30s	20½	
16s	17½		40s	25	
20s	18		50s	31	
24s	19				

SOUTHERN FRAME PEELER CONES.

8s	15		20s	17½	@17¾
10s	16		22s	18	
11s	16¼		24s	18½	
12s	16½	@16¾	26s	19	
14s	17		30s	20½	
16s	17¼		40s	21	@21½
18s	17½				

NEW ENGLAND MILL SHARES.

Name of Mill	High	Low	Name of Mill	High	Low
Amoskeag Mfg. Co	300	285	Great Falls Mfg. Co	175	149¼
Arkwright Mills	105	100	Granite Mills	150	145
Androscoggin Mills	155½	150	Gosnold Mills Co.		105
Arlington Mills	141¼	128	Grinnell Mfg. Co.		205
Atlantic Cotton Mills	74¾	60	Lawrence Mfg. Co	155	130
Acushnet Mill Corp.		320	King Philip Mills		162½
Barnard Mfg. Co.	110	108¼	Mass. Cotton Mills	125	90
Bates Mfg. Co.	222½	195	Merrimack Mfg. Co.	49½	82
Bourne Mills	96	95	Merrimack Mfg. Co. pfd.	89	75
Border City Mfg. Co	150	145	Pepperell Mfg. Co.	294	275
Cabot Mfg. Co	76	75½	Seaconnett Mills		81
Chase Mill	135	130	Trem't & Suffolk Mills	102¼	85
Everett Mills	135¾	125	Wampanoag Mills	101	100
Flint Mills	106	105	Wamsutta Mills	125¼	120
Franklin Mill Corp.	106½	106½			

SOUTHERN COTTON MILL STOCKS.

Quotations by F. C. Abbott & Co.,
Charlotte, N. C.

	Bid	Asked		Bid	Asked
Aiken Mfg. Co.	75	85	Lanett		121
American Spinning		146	Langley Mfg. Co.	90	96
Arkwright Mills		...	Linden, N. C.		120
Arlington		166	Limestone	140	...
Avondale	116	125	Loray, pref 1901		96½
Augusta, Ga.	60	...	Lowell		...
Bonnie	121	...	Mooresville, N. C.	110	...
Bloomfield		118	Lumberton		226
Brandon Cot. Mills	137	...	Mills Mfg. Co.		106
Brookside		106	Modena Mills		125
Capitol City, pref.		82½	Mollohon		105
Chadwick-Hoskins Co.	100		Monarch, S. C.		102
Clara	121		Newberry		146
Clover		...	Nakomis, N. C.		156
Clinton		...	Olympia, 1st	125	...
Clifton, pref.		103	Ozark		151
Cliffside	155		Patterson		150
Chiquola Cot. Mills	124	131	Piedmont Mfg. Co.		176
Cherokee Mfg. Co.		...	Pelzer		...
Converse		117	Pell City, com.		95
Dallas Mfg. Co., Ala.	95	...	Pell City, pref.	100	...
Dillon	65	68	Saxon		...
Efird, N. C.	125	...	Sibley, Ga.	60	...
Elmira, pref.	96	...	Social Circle	99	...
Eagle & Phoenix		128	Spartan Mills	125	...
Easley	144	151	Springstein		...
Edenton, N. C.		...	Statesville Cot. Mill	107	...
Exposition		240	Trenton, N. C.		...
Fairfield	75	...	Tryon, N. C.		143
Florence, N. C.		131	Tuscarora	115	...
Gaffney Mfg. Co.	68	75	Tucapau, S. C.	200	...
Gaston		100	Toxaway		92
Gainesville	49	...	Union Buffalo, 1st pref.		66
Gibson	95	99	Union Buffalo, 2d pref.		21
Graniteville, S. C.	160	168½	Victor Mills, S. C.		125
Gray Mfg Co.	121	126	Warren Mfg. Co., pref	103	...
Grendel		119	Washington Mills	25	31
Greenwood		97	Washington Mills, pref	107½	...
Highland Park		170	Watts		98½
Hartsville, pref.	100	...	Ware shoals		...
Hartsville		...	Whitney		125
Inman Mills S. C.		107	Wiscassett	125	
Kesler	135	...	Woodside	102	105
Jno. P. King Mfg. Co.	91½	...	Woodruff		124
Lanaster, com	123	...	Williamston		108

THE COTTON MARKET.

BY H. AND B. BEER.

The advance of about $1.00 per bale on January 20, was due entirely to speculative support, induced by the issuing of a bullish report on quantity of cotton ginned to January 16th., the National Ginners' Association estimating the amount ginned at only 12,628,000 bales against 10,340,000 last year and 12,177,000 year before last, the amount supposed to have been ginned during the last period being placed at about 182,000 bales compared with 388,000 last year and 435,000 year before last. It is said that this will probably be the last report of the National Ginners' Association to be issued this season. The amount remaining to be ginned, it is thought, will not exceed 131,000 bales and that actual growth will hardly be 12,800,000, while the commercial crop, which will include linters, etc., will be about 13,250,000 bales.

Liverpool was not at all good in early hours, which affected American markets unfavorably at opening, prices having shaded somewhat easier, but a reaction, swift and of much importance, developed on the publishing of the National Ginners' Association report, which, by the way, was a sort of a general review of the situation, dwelling upon the possibilities of large consumption this season, of the possibilities of the crop having been overestimated and the beneficial effect on market that would come of the substitution of genuine bucketshop laws for the unwise anti-future law now in force in many of the Southern States.

Before close of the English market, Liverpool got wind of the National Ginners' Association prediction for small ginnings the past period, January 1st to 16th, and the result was that the British market scored an advance of nine English points from the day's low level.

Private reports are to the effect that plantation supplies are light, and official statement tends to confirm such advices, receipts at 13 inland towns having been 57,000 bales compared with 55,000 last year and 92,000 year before last, while stocks at the same points, for the same period, show a relative loss of about 11,000 bales when compared with one year ago.

On the basis of the National Ginners' report, the census report on quantity of cotton ginned to 16th inst., should show about 12,647,000 bales, but it is probable that about 250,000 bales were ginned during the last period and that a total of about 12,715,000 bales will have been accounted for.

In event of market declining on such possible figures it would probably do to buy the market for a possible further rise, as sentiment is bullish, and any favorable development will be taken advantage of to influence prices to a higher level.

SOUTHERN SOFT YARN SPINNERS.

AN OPTIMISTIC FEELING.

The annual meeting of the Southern Soft Yarn Spinners' Association was held in Charlotte, N. C., on the 16th of last month, with 321,000 spindles represented and members present from Tennessee, Alabama, Georgia, South Carolina, Virginia and North Carolina. The meeting was called to order by the president of the association, L. J. Tyson, Knoxville, Tenn., and J. F. Taylor, Kinston, N. C., acted as secretary in the absence of C. T. Leonhardt, Knoxville, Tenn.

A poll of the mills was taken and it was found that practically no stocks of yarns were on hand and mills were sold ahead on an average of from three to six months. The consensus of opinion among members was that cotton would advance to higher prices during the season and that yarns must follow.

A resolution was passed urging all soft yarn spinners in the South to hold for a basis of 16½ cents for No. 10s with New York spots at 9½ cents. It developed at the meeting that a large number of inquiries had been made within the last few days and several large contracts had been placed on the above basis. A number of new mills were added to the association and its affairs were found in good condition. Speaking generally, the meeting seemed to be very optimistic, and most members look for good business during the coming year.

The annual election resulted as follows: J. P. McRae, Laurinburg, N. C., president; J. F. Taylor, Kinston, N. C., first vice-president; J. F. Cannon, Concord, N. C., second vice-president, and Robert Chapman, McColl, S. C., secretary and treasurer.

Resolutions passed at the last meeting held in Charlotte in October, relative to curtailment and prices had been generally adhered to by members, according to reports submitted, with good results.

After dyeing on a chrome base the color is liable to turn green with age and exposure, and this may be accounted for by the slow chemical change this mordant undergoes in course of time.

The Textile Mill Situation in New England and the South.

NEW ENGLAND MILL SITUATION.

(*Special Correspondence.*)

The market for cotton fabrics has shown a strong undertone since the turn of the year, with especial interest in prints and drills which have been advanced several times and are generally contracted for through the balance of the winter months. There is a greater interest in wide sheetings and drills for export than at any time since the rally in the market last fall. Chinamen have been placing substantial orders for future delivery at firmer prices than for spot goods, while exports for the first three weeks in January were more than double the amount exported during the same period in 1908.

All over New England there is a better feeling than has prevailed for many months and the outlook for the cotton industry is very promising. The writer recently made a careful canvass of the mill treasurers in the textile manufacturing centers and found that optimism was the keynote of every interview and predictions were freely made that after the middle of this year the cotton industry would be as active as during the boom times of 1907.

Mill treasurers in New Bedford are generally hopeful, but at the present time they are profoundly optimistic and believe we are approaching an era of tremendous demand for fancy goods. Nearly every mill in this city has extensive improvements and additions under way—in many cases, doubling the capacity of their plants. The Wamsutta and the Taber are getting their large additions onto a paying productive basis. The Page has ordered 500 new looms and about 25,000 new spindles, and so one might go on and enumerate the additions and improvements in New Bedford until every textile plant in that city had been mentioned. Two new mills are to be constructed during this year and a third is contemplated. Profits are beginning to show up satisfactorily and increases in dividends will be expected in July. The Taber will go onto a dividend basis in October.

The Fall River market never appeared stronger. Orders are plentiful at advancing quotations and mills are well stocked with low priced raw cotton that will cover their contracts for six months at least. There is a strong feeling among treasurers in this city that expansion of manufacturing plants will soon be in order. The Sagamore has started the ball rolling by issuing stock for a new weave shed, and other mills are formulating plans for immediate additional capital requirements. Labor is quiet with efficiency of production at the highest point in several years. The fact that cotton manufacturers did not reduce wages under the sliding scale in December has brought operatives and owners very close together; in fact, labor disturbances are more remote than for many years. Naturally this has given greater confidence to the manufacturers and stability to the mill shares.

In Lowell and Lawrence, business is increasing weekly and there is a feeling of confidence among manufacturers. The Massachusetts and the Appleton, of Lowell, are sold ahead, while the Pacific and the Everett, of Lawrence, are buried with orders. It will be 1910 before Everett's new mill is in operation. The announcement that the Pacific corporation desired to purchase the Cocheco Mfg. Co., of Dover, N. H., at $75 per share, was a great surprise for it was generally understood that the Pacific would build a $2,000,000 addition in Lawrence during this year. The Atlantic Cotton Mills, Lawrence, is earning at the rate of 14 per cent. on its capital stock after charging off a liberal amount for depreciation. This stock has sold at $75, or less, per share for several years, although 4 per cent. dividends are being paid on it.

The Amoskeag Mfg. Co., Manchester, N. H., will finance their 100,000 spindle mill, costing over $2,000,000, without capital requirements. This company has a net liquid surplus of over $2,000,000, which it has held with the idea of purchasing Stark Mills from the Mt. Vernon-Woodbury Cotton Duck Co., of Baltimore. This property is adjacent to Amoskeag and could be used very profitably by them, but it is understood that the duck trust's price is prohibitive, and so the new mill now projected was promoted by the Amoskeag interests.

In Rhode Island business is vastly improved and among the B. B. & R. Knight's fifteen mills in that State there is a big programme of improvements laid out. Charles Fish, who is now the general manager of this group of mills, is a very progressive man and during the fourteen years that he was agent of Cocheco Manufacturing Co., of Dover, N. H., he entirely reconstructed that mill and its printing plant at a cost of about $2,000,000. He will spend several times that amount on the Knight mills before 1912 if present plans are carried out. The Manville Mills in Woonsocket are operating full time on orders that will cover their production well into the spring months.

The cotton yarn market has shown little improvement since the first of the year. Prices are inclined to firmness, but contracts are being placed daily at concessions, so anxious are spinners to keep their surplus stocks down. Print cloth yarns are in better request and a slight advance in price will be announced shortly. Cotton braid and tape can be purchased to-day for 60 per cent. of prevailing prices during 1907 up to the month of the panic. The writer paid 52 cents per pound for 65 carrier 32/2 cotton braid in 1907 that can be purchased for 32 cents per pound at this moment. This illustrates the tremendous decline in the price of braid yarns.

Amoskeag ticks and ginghams have been advanced with no diminution of orders. Amoskeag interests state that they are sold far ahead and can see nothing but higher prices for the future. Ginghams are in heavy demand and are holding firm at best prices. There is a small stock on hand among the jobbers and higher prices are looked for. Cotton sheetings are firmer and drills are in urgent demand. Overall makers are buying heavily of 2.85 drills to cover their 1909 contracts.

Draper Co. increased the dividend on their common stock on January 1st from a 4 to an 8 per cent. basis, which represents just about the increase of their business. It is stated by an official of that company that their business has doubled during the last six months and at the present time they have the largest number of unfilled orders for fifteen months. The Whitin Machine Works, the Stafford Co., and the Crompton & Knowles Loom Works

are all busy on orders for spring delivery. Kilburn, Lincoln & Co., of Fall River, have booked more orders for looms during January than during any two months last year.

Cotton mill stocks continue to advance at every auction sale and the better class of New England cotton mill stocks are selling at the highest prices. The demand for New Bedford and State of Maine cotton stocks exceeds the supply four to one. There are a few weekly offerings of Fall River stocks and these are snapped up at advancing prices.

NEW ENGLAND COTTON MILL INDUSTRY.

(*Special Correspondence*)

Every indication connected with the cotton manufacturing industry of New England seems to point to a year of better things—the resumption of work in many factories and the building of new ones. The extensive additions to those already established show that the managements are not only hopeful of the future, but well-satisfied that their investments will be fruitful, and safe.

Although there has been a marked improvement in manufacturing conditions, it is a fact that print cloth prices at the first of this year were not so good as they were a year ago. On January 3, 1908, regulars were quoted at 4¼ cents nominal, but the market was dull and goods were not easily moved. Cotton was then at 11.40 cents in New York; the mills could not manufacture with profit and curtailment became necessary.

On the other hand, with the beginning of 1909 while print-cloths were quoted at 3 7-16 cents there was a good market for them, with cotton quoted at 9.30 cents a pound. Wages were steady and mills were manufacturing at a fair profit.

With such conditions obtaining throughout the textile industry in New England the year 1909 seems sure to be satisfactory. And when it is recalled that foreign markets are being called on to the extent of $70,000,000 a year to provide fine cottons, with the increase of people and their ability to buy, and tastes improving, the importation of $100,000,000 of such fabrics is not far away, unless the New England cotton factories enter the field and produce similar goods. That there is an opportunity for the cotton manufacturing industry of New England to be doubled during the next decade is declared by those who are studying the situation. It is expected that the coming year will show a decided step in this direction. At present, Bristol County, Massachusetts, the seat of those great cotton-manufacturing cities of New Bedford, Fall River, Taunton, with their suburbs, is producing more cotton goods than any other county in the United States, and still the field is not all taken up.

MASSACHUSETTS.

That the cotton mills of New Bedford have prospered during the year 1908 is evident from the financial statistics made public, for the average earnings have been 8.86 per cent. on a capital stock of $20,287,000. Excepting the new Taber mill, the average is brought up to 9.3 per cent. The dividends paid amounted to $1,798,595 which is $57,460 greater than the dividends paid at Fall River on a capital stock of $27,125,000. The number of employees was 21,520, tending 2,137,811 spindles and 38,061 looms. There has been an increase in spindlage, and the industry is on a very firm basis. Last month the stockholders of the Dartmouth Manufacturing Company increased the capital stock from $600,000 to $1,200,000.

In compliance with a custom established in 1889, the Bourne Mills of Fall River have paid the 38th semi-annual profit-sharing dividend to the employees. The dividend was figured on the basis of 2½ per cent. on wages paid during the preceding six months. The total amount paid out was about $3,000. The next dividend will be paid on the pay-day before July 4, 1909.

It is reported that Rudolf F. Haffenreffer, Jr., and others of Fall River are interested in a plan to manufacture cotton blankets, and should a mill be established it would be the first of the kind in that city.

The American Printing Company of Fall River has been engaged on night work for some time, and has been running until 11 o'clock in order to meet demands for its output.

The creditors' committee of the Arnold Print Works, North Adams, and its allied concerns has paid the large creditors a last cash dividend of 30 per cent., making 55 per cent. in all in cash, and 45 per cent. in first mortgage bonds. The small creditors were paid cash in full on their claims. The receivers, Henry E. Warner, J. J. Storrow, and W. M. Crane, have been discharged, the property and finances having been adjusted and turned over to the creditors' committee.

The John W. Barlow Company, Lawrence, has been looking for a mill location in the South, with the intention of developing a plant to be worth about $250,000 when a suitable place is found.

S. S. Slater & Sons, Webster, have been installing new spinning mules, made in Worcester, to take the place of the English-made mules formerly used.

The Berkshire Cotton Manufacturing Company, Adams, has equipped 100 looms in the plant with electric stop-motions, as an experiment, with the intention of equipping all the looms if these work satisfactorily.

Every effort has been made to get the new Army and Navy Cotton Duck Company's mills at Wilkinsonville ready for operation, over 100 men being employed for some time. Over 80 looms have been set up in the weave shed, and 1000 spindles in mill No. 2. An eight-foot pen-stock with a Hunt water-wheel has been installed, to generate the power for the dynamos which have been set up. It is expected that the opening will not be long delayed.

It has been reported that the Bullard Thread Company, Holyoke, has been sold to the American Thread Company. The Bullard concern has been entirely independent of the thread syndicate. It recently paid a semi-annual dividend of 4 per cent., and it has been intimated that the demand on the plant would necessitate an enlargment.

RHODE ISLAND.

It is the intention of the management of the Atlantic Mills, Providence, to install an electric drive in every department, and plans have been prepared for a power house to be built in Olneyville to contain a 1500-kilowatt steam turbine of the Westinghouse-Parsons type to be delivered in three months, or about the first of April. With the installation of the electric power the several steam engines in the plant will be removed.

The old Rhode Island Worsted Mills at Olneyville have been purchased by the Elston people and have been re-equipped for spinning yarns, and later a weaving department will be established with 92 looms.

Work is in progress on the addition to the mill of the Lorraine Manufacturing Company at Pawtucket, but it is going slowly until the spring weather will permit more active operations. It is to be of brick and built in the rear of the office building.

CONNECTICUT.

As a result of the extensive rains which occurred the early part of the year a new condition has developed among the factories of the State depending on water-power, and mills have been busy since then. The Aldrich Cotton Mills, Union, have been working day and night, the capacity having been doubled by the installation of more cotton looms which brings the total number to 1500. More employees will be required and more machinery will be added.

It is expected that B. B. Parker, one of the former owners of the Ravine Mills, Rockville, will organize a new company to take the plant which has been in the hands of a receiver. The plant was taken by a Hartford bank under foreclosure proceedings.

It is understood that the Pequot Mills of the Mercer Manufacturing Company, Montville, will be reconstructed by the late purchaser, Charles D. White, and 100 looms of latest type be installed. The old mill is to be rebuilt and a new engine will be installed.

NEW HAMPSHIRE.

Plans are being perfected for the new mill of the Amoskeag Company of Manchester, and the plans for the power house provide for 30 upright Manning boilers equipped with the most recent methods for feeding and stoking. The engines to be installed will be of the turbine type similar to the one already in use. There will be two of them with the necessary pumps, etc.

The first dividend since 1895 has been paid to stockholders of the Newmarket Manufacturing Company, Newmarket. It was $1.50 per share.

On account of the difficulties incurred during the past few years the directors of the Cocheco Mills, Dover, have voted to sell the property at $75 per share, to the Pacific Mills Corporation, that concern assuming all of the assets and liabilities of the Cocheco corporation. This figure of sale puts the price of the plant, etc., at about $1,125,000 which is about $11 per spindle, and when it is estimated that it costs about $20 per spindle to start a mill, this sale is something of a bargain, for the plant is in good condition.

The Cocheco mills were organized in 1879 to manufacture cotton cloths and prints. It now turns out about 65,000,000 yards of printed cloth annually, buying considerable cloth from Fall River and Rhode Island mills. The capital stock authorized is set at $1,500,000, par value formerly $500, but reduced in 1908 to $100. By the last report the assets of the company were $3,952,613 and a surplus of $381,534. The debt was about $2,071,187. At a local auction, stock recently sold at $50 per share.

MAINE.

It is reported that citizens of Old Town have agreed to either take an amount of stock or else pay the cotton mill, which it is proposed to establish, the interest for five years on $100,000.

The new knitting mill at Topsham, now in progress of erection by the Max-Mar-Lan Knitting Company is growing fast. A small number of knitting machines will be started, the number to be increased later. The output will be cotton and worsted hosiery for men.

SOUTHERN TEXTILE MILL NOTES.

(Special Correspondence.)

The month of January was not made notable by any phenomenal developments in the textile industry of the South, though taking everything into consideration, it may be stated that substantial improvement was made in conditions affecting mill men. There have been many avenues through which this steady improvement has been reflected.

First, in the matter of new mill construction, January was marked by greater activity than any month perhaps for over a year. A great many new mills have been chartered during the month; others have started work on enlargements and improvement of facilities for handling business. The year 1908 was notable, as before observed, by the heavy decrease in construction work. It is confidently believed, and there is every indication that such will be the case, that 1909 will be up to the records set in years past in new mill construction work. Before the panic a number of Southern mills had planned enlargements and the installation of new equipment, but the stringency in the financial world forced a postponement of plans. The new year has witnessed the commencement of these extensions.

An idea of the manner in which capitalists are turning loose their funds may be had by a glance at the list of new companies recently set on foot. For instance, a 50,000 spindle mill was launched in North Carolina, also a 35,000 spindle mill, and numerous others of smaller equipment.

Another favorable indication is the steady upward trend of prices for the manufactured product. A strong bearish effort was launched during the month in yarn. Circulars were sent out from New York claiming that 22,000,000 pounds of yarns were held in two markets, presumably New York and Philadelphia. A number of well informed mill men, interviewed relative to this report, state that they do not believe there is such an accumulation as reported. Secretary T. W. Crews, of the Southern Hard Yarn Spinners' Association, states, in connection with the report, that he does not consider conditions nearly so blue as painted. He states that during the past few days a number of big orders received by spinners have been recorded in his office, and that prices show an improvement of one-half cent over the quotations of a week ago. These orders represent actual sales and not mere rumors.

The lull which followed the holidays has passed, and it is the opinion of mill men that yarns will advance in price and that general conditions will continue to improve.

One of the most important events of the month was the annual meeting of the Southern Soft Yarn Spinners' Association, held in Charlotte, N. C., on the 16th. About 321,000 spindles were represented at the meeting, and spinners were present from North and South Carolina, Georgia, Virginia, Alabama and Tennessee. A poll of the mills was taken which showed practically no stock of yarns on hand, and that the mills were well sold ahead. New officers were elected as follows: President, J. P. McRae, Laurinburg, N. C.; first vice-president, J. F. Taylor, Kinston, N. C.; second vice-president, J. F. Cannon, Concord, N. C.; secretary and treasurer, Robt. Chapman, McColl, N. C.

Prominent mill men interviewed at this meeting reported that inquiries were increasing, and several had taken orders that sold them ahead for several months. A spirit of optimism was expressed on all hands, and spinners seemed of the opinion that prices of yarns would certainly advance as cotton advanced in price.

Considerable interest centers around child labor bills introduced in several legislatures of the South. There seems to be considerable opposition to the bill up in the general assembly of North Carolina, the claim being made that it is entirely too drastic in its provisions. It is not likely, however, the bill will pass at this session, as the North Carolina legislature passed a child labor law two years ago that meets with popular favor, and is approved by 90 per cent. of the manufacturers who are opposed to the employment of children in the mills. In South Carolina an effort is being made to amend the present child labor law by adding a compulsory education provision. The compulsory education of children is favored by the South Carolina Cotton Manufacturers' Association, and at its recent meeting a resolution was passed urging the general assembly to incorporate such an act into law.

One of the best indications of improved conditions among southern mills is the recent revival in the export trade. For two years past little export business has been done. During the past two weeks there has been a sale of more than 35,000 bales of cotton goods for the Orient. The great bulk of business was for China shipment.

From present indications the spring business on all classes of printed cottons will far exceed that of last year.

The effort of the U. S. Agricultural Department to standardize grades of cotton was endorsed in a resolution adopted by the board of governors of the American Cotton Manufacturers' Association, which met in Charlotte, N. C., recently. The president of the association was also authorized, in a resolution adopted, to join in a call, with various other organizations, for a meeting to be held in Indianapolis some time about the middle of February to discuss the tariff question. The main object is the formation of a tariff commission to be a permanent department of the government. The board decided to hold the next meeting of the association in Richmond, Va., instead of New York, date of meeting to be May 2 and 26.

D. A. Tompkins, of Charlotte, prominent in southern mill circles, delivered an interesting address at the recent annual meeting of the South Carolina Cotton Manufacturers' Association, held at Charleston, on "American Cotton Manufacturer and the Tariff." Mr. Tompkins contended that the American cotton manufactured goods should be protected by an import duty. Spinners present at this meeting expressed themselves as hopeful of a good business during the year. Reports showed that all the mills of that State are running full time again. Ellison S. Smythe, of Greenville, was elected president of the Association.

Reports recently made public give a good idea of the importance of the textile industry in the South, although figures refer only to two Southern States, North and South Carolina. The sum of $120,000,000 is invested in mills in these two States and the average dividend declared for 1908 is estimated to be 6 per cent. One of the best posted mill men of the South is of the opinion the average dividend of all southern mills is 6 per cent. Of course, this represents the surplus left over to some extent. Some of the mills declared as high as 10 per cent., while others fall under the 6 per cent. mark. In other words, mills have paid out to stockholders in the two Carolinas over $7,000,000 in dividends during the past year, which is not a bad showing for a panicky year.

COTTON MILLS IN NORTH AND SOUTH CAROLINA.

Many of the mills in the two Carolinas paid during the past year a dividend of 10 per cent. Others were able to pay only 8 per cent. and some were unable to pay anything at all. Conservative mill men of Charlotte, N. C., are of the opinion that six per cent. would be a fair estimate of the average per cent. paid.

In its report, the North Carolina Labor and Printing Bureau discloses the fact that there are in North Carolina 352 cotton, woolen, silk and knitting mills with a capital of $54,192,300, which employ 3,103,079 spindles. The total capital of all the mills in South Carolina is found to be approximately $65,000,000 and a spindlage of about 4,000,000. To summarize, Carolina mills are capitalized at $120,000,000 with a total spindlage of 7,000,000. The year's profits on the basis of 6 per cent. would amount to $7,200,000.

Milling interests of Spartanburg, S. C., have just declared semi-annual dividends aggregating $400,000. Here are reports from some of the mills of Spartanburg and vicinity:

Name of Mill	Rate	Capital	Amount
Victor Mills, com	4	$500,000	$50,000
Blue Ridge Hosiery Co.	4	38,000	1,520
Crescent Knitting Mills	3½	23,000	805
Woodruff Cotton Mills	4	350,000	14,000
Whitney Mfg. Co.	3	350,000	10,500
Pacolet Mfg. Co., pfd.	3½	1,000,000	35,000
do common	3½	1,000,000	30,000
Spartan Mills	3	1,000,000	30,000
Saxon Mills	4	300,000	12,000
Enoree Mfg. Co.	2½	400,000	10,000
Tucapau Mills, pfd.	3	193,100	5,793
do common	4	269,760	10,790
Drayton Mills, pfd.	3	350,000	10,500
Arkwright Mills	3	200,000	6,000
Clifton Mfg. Co., pfd.	3½	300,000	10,500
do common	3	1,000,000	30,000
D. E. Converse Co.	3½	500,000	17,500
Beaumont Mfg. Co., com	3	260,000	7,800
do preferred	3½	110,000	3,850
Arcadia Mills	3½	200,000	7,000
Inman Mills	3½	150,000	5,150
Laurens Cotton Mills, Laurens, S. C.	4½	350,000	15,750
Watts Cotton Mills, Laurens, S. C.	4	300,000	12,000
Clinton Mills, Laurens, S. C.	4	300,000	12,000

The Lancaster Cotton Mills, of Lancaster, S. C., declared a semi-annual dividend of 4 per cent. on common stock and 3½ per cent. on preferred. Total dividend paid amounted to over $27,000.

Following Greenville mills have declared semi-annual dividends as follows:

Name of Mill	Rate	Capital	Amount
American Spinning Co	4	$600,000	$24,000
Brandon Mills	4	450,000	13,000
Mills' Mills	3	380,000	11,400

Woodside Mills	3½	500,000	17,500
Monaghan Mills	4	700,000	28,000
Poe Mill	4	500,000	20,000
Carolina Mill	3	50,000	1,500
Piedmont Mfg. Co., Piedmont, S. C., q'tly	3	800,000	24,000
Fork Shoals Mills, Fork Shoals, S. C.	3½	52,000	1,820
Pelzer Mills, Pelzer, S. C.	4	1,000,000	40,000
Easley Mills, Easley, S. C.	4	500,000	20,000
Victor Mills, Griers, S. C., common	4	500,000	20,000
do preferred	3	200,000	6,000
Jonesville Mfg. Co., Jonesville, S. C.	3½	130,000	4,500

NEW MACHINERY AND TRADE NOTES

EXHIBITION WEAVE ROOM OF THE DRAPER COMPANY, HOPEDALE, MASS.

The accompanying illustration gives an idea of the looms that are being manufactured by the Draper Company, Hopedale, Mass., and which can be seen at the company's works by customers or others interested. This company has these looms equipped with warp and filling and in condition to be operated at short notice.

They include a great variety of weaves as to the goods, and a large share of standard devices as to mechanical construction. Among them are the following:

No. 1. 32-inch E Model Loom. Goods, cotton worsted; 50 sley, 42 picks; cotton warp, No. 26 two-ply worsted filling.

No. 2. 32-inch E Model Loom. Goods, ginghams, (stripes); 80 sley, 88 picks; No. 50 warp, No. 56 filling.

No. 3. 36-inch E Model Loom. Goods, filling sateen; 64 sley, 130 picks; No. 28 warp, No. 36 filling.

No. 9. 64-inch D Model Loom. Cloth, worsted dress goods; 42 sley, 48 picks; No. 28 two-ply warp, No. 28 ings.

No. 10. 40-inch Special D Model Loom. Goods, light duck; 50 sley, 40 picks; No. 10 two-ply warp, No. 14 two-ply filling.

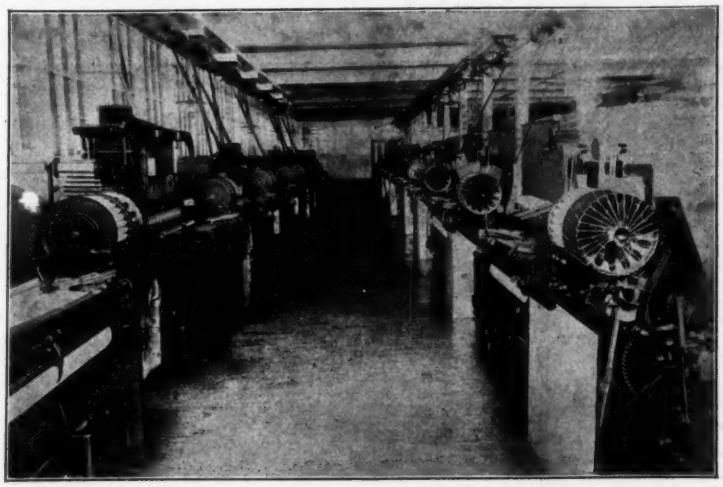
No. 11. 90-inch L Model Loom. Goods, wide sheetings; 64 sley, 72 picks; No 22 warp, No. 21 filling.

No. 13. 32-inch Special E Model Loom. Goods, pillow tubing; 64 sley, 76 picks; No. 28 warp, No. 36 filling.

No. 14. 32-inch K Model Loom. Goods, fine lawns; 88 sley; 80 picks; No. 60 warp, No. 85 cop filling.

No. 15. 28-inch Special E Model Loom. Seamless grain bags; 25 sley, 22 picks; No. 7 two-ply warp, No. 31 two-ply filling.

No. 16. 30-inch E Model Loom. Goods, warp sateen; 110 sley, 72 picks; No. 22 warp, No. 21 filling.



THE DRAPER CO.'S EXHIBITION ROOM.

No. 4. 32-inch H Model Loom. Goods, corduroy; 48 sley, 300 picks; No. 26 warp three-ply, No. 36 filling.

No. 5. 40-inch E Model Loom. Goods, fine lawns; 88 sley, 92 picks; No. 80 warp, No. 120 cop filling.

No. 6. 34-inch K Model Loom, with 20 harness dobby. Cloth, figured dress goods. 80 sley, 84 picks; No. 50 colored warp, No. 56 filling.

No. 7. 40-inch E Model Loom. Goods, sheetings; 80 sley, 92 picks; No. 28 warp, No. 36 filling.

No. 8. 28-inch E Model Loom. Goods, standard print cloth; 64 sley, 64 picks; No. 28 warp, No. 36 filling.

No. 17. 36-inch E Model Loom. Goods, cotton flannel; 44 sley, 48 picks; No. 21 warp, No. 10 filling.

No. 19. 28-inch E Model Loom. Goods, denim; 68 sley, 48 picks; No. 9 warp, No. 9 filling.

No. 20. 64-inch D Model Loom. Goods, sheetings; 68 sley, 72 picks; No. 22 warp, No. 22 filling.

SIZEOLEUM, manufactured by the Arabol Manufacturing Company, New York, when mixed with arabol starch, corn starch or potato starch, makes a most satisfactory sizing for cotton warps, sheetings, domestics and print cloth warps.

It is especially recommended for the South, as it has the advantage of resisting the influence of the climate.

MOTOR STARTERS: The Ward Leonard Electric Co., Bronxville, N. Y., has placed upon the market a motor starter equipped with "tight cases enclosing all current carrying parts," for use in wet, dusty, linty or dirty places, where dust or combustible flyings would be liable to accumulate on them, replacing all types of dust-tight, fireproof enclosing cabinets.

GERMANTOWN BRAID CO., Germantown, Philadelphia, a meeting of directors of this company was held recently when the following officers were elected: President, I. M. Koch; vice-president, E. F. Whitehill; treasurer, H. L. Stern; secretary, W. W. Sibson, and assistant treasurer and secretary, M. S. Hirsch.

THE ARABOL MANUFACTURING CO., New York, are large manufacturers of starches, sizing and finishing compounds softening oils, softeners of every description and related articles. They are well equipped for producing absolutely modern compounds, based upon the best practical experience controlled by scientific methods and investigations. Their facilities for supplying the needs of mills in their line are unexcelled. They will meet any particular conditions of manufacturing if stated with the order.

CHARLES T. MAIN, Boston, Mass., well known through his extended practice as mill engineer and architect has been appointed by the council of the American Society of Mechanical Engineers a member of the National Conservation Commission, with special reference to water powers. Mr. Main is particularly well equipped for this work through wide experience in examinations and reports upon various water powers in this country and in Mexico and British Columbia. He is just now engaged in two large developments on the upper Missouri River near Great Falls, Montana, each of which will provide for the distribution of 36,000 horse-power.

SIBSON & STERN, Germantown, Philadelphia. A meeting of directors of this company was held recently when the following officers were elected: President, W. W. Sibson; vice-president, I. M. Koch; treasurer, and general manager, H. L. Stern; secretary, E. F. Whitehill, and assistant treasurer and secretary, M. S. Hirsch.

THE MASON MACHINE WORKS, Taunton, Mass. has sent out to the trade a handsome calendar for 1909, the illustration being particularly fine. It is a reproduction in colors of C. M. Russell's painting "Jerked Down," and, mounted on heavy black board, makes an attractive and useful ornament in any office.

THE DRAPER COMPANY, Hopedale, Mass., are sending out a Russian leather-covered pocket memorandum book, diary and card case, with recipient's name printed on cover in gold letters. It is one of the most attractive and useful little books we have yet seen and undoubtedly will make many grateful friends for the donors.

FARBENFABRIKEN OF ELBERFELD COMPANY, New York, has issued color cards as follows: *Katigen Deep Green 5 B Extra Conc.* This is a new color compared to the older green brands. It is recommended for the dyeing of loose cotton, yarn and piece goods which are required to be possessed of a good fastness to light and a fairly good fastness to boiling. *Katigen Deep Black R.* This is recommended for the dyeing of loose cotton, yarn and pieces in vats and machines. It is not only a good color for the production of black but also for the production of fast bluish grays, and, moreover, suitable as a combination color for olives, browns, etc. *Benzo Fast Bordeaux 6 BL and Benzo Fast Red 8 BL.* This may be used as self colors for producing bluish claret shades or bright reds, and in combination with one another for producing fiery garnet shades. Both brands are moreover rather valuable as red shading colors, they are good for dyeing all kinds of cotton material and can also be used for the dyeing of halfwool, both fibers being dyed almost a solid shade when the temperature is properly regulated. *Cloth Red BC.* This yields bright full claret shades of good fastness to light, washing, milling and steaming. It is recommended for the dyeing of loose wool, slubbing and yarns for blankets, blouses and dress goods required to be fast to washing as well as for checking threads in gentlemen's suitings, furthermore for shoddy and pieces (flannels) required to possess a good fastness to washing and light. *Brilliant Fast Blue 4G.* This is distinguished by a most excellent fastness to light, and is recommended for the dyeing of loose cotton, yarn and pieces in all such cases where fastness to light is of main consideration.

CASSELLA COLOR COMPANY, New York. This company has recently issued color cards in the form of a large volume showing the effect of diamine colors on cotton yarn (self shades). Methods for using these colors are given with dyeing directions and recipes wherein nearly every known shade is shown.

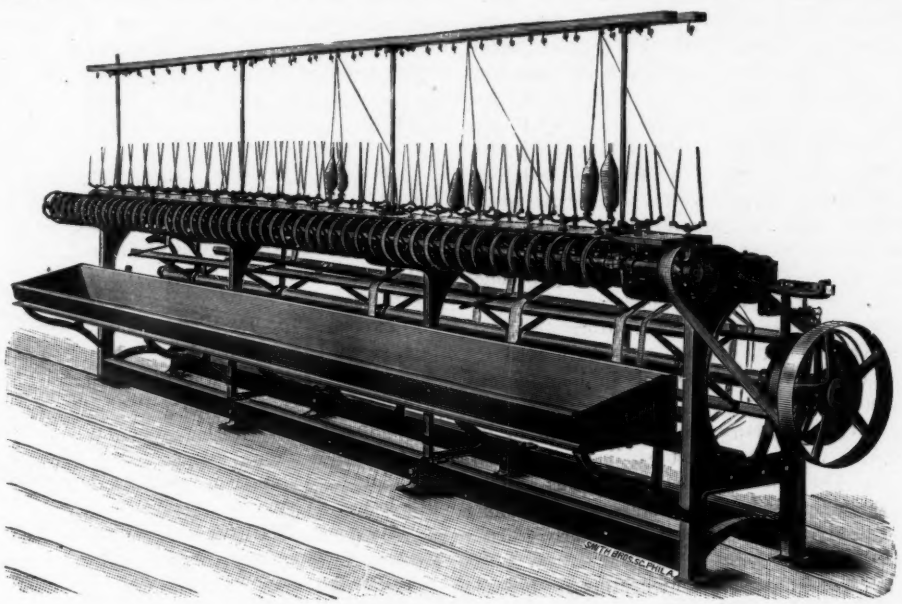
WALCH & WYETH, Chicago, Ill. We are in receipt of a catalogue from this company relating to its Erwood straightway swing gate valve, which is put upon the market as an improvement in gate valves in which are incorporated original features in valve construction, productive of results said to be not possible with any other valve. It is an embodiment of the features of a gate and check valve in one, and capable of performing not only the functions of either, but offering a wide range of adaptability and application possessed, it is said, by no other valve. The action of the swing gate is controlled by the spring, the tension of which is regulated by the pressure desired. As a check valve for water it permits the current to be reversed under pressure at a moment's notice. It is intended for use in feed pipes, suction lines, and as a check and gate generally.

DAILY TRADE RECORD DIRECTORY. This directory is published by the *Daily Trade Record,* 112 Worth Street, New York, and is a directory of clothing manufacturers; dyers, bleachers and finishers; cotton mills: manufacturers of braids, buckles, buttons, and the like; cloak and woolen skirt manufacturers; cloth examiners, spongers and refinishers; tailors to the trade; piece goods houses both woolen and worsted; woolen jobbers; woolen mills; yarn dealers and spinners; sample cards and books, etc.

WESTERN ELECTRIC COMPANY, New York City. One of the quickest installations of a telephone switchboard was that recently made by this company for The Central District Printing & Telegraph Company, Franklin, Pa., to replace one that was destroyed November 17th by fire. When the local telephone officials saw that its old quarters were doomed an order was wired to the Pittsburg branch of this company to furnish the means by which the destroyed service could be again put in operation. This was done within twelve days after the fire, and subscribers were given a complete service superior in many respects to that obtained from the old switchboard.

A SLACK REEL.

In our issue of January we printed a cut of a reel manufactured by Lindsay, Hyde & Co., Philadelphia, with an explanation that the cut showed a slack reel, whereas the cut was one of this firm's regular reels, a mistake having been made in the selection of the proper cut to be printed. Its regular plain reels are used for reeling from cops and single or double-headed bobbins, and is much in use among the cotton mills of the South.



A SLACK REEL.

The accompanying illustration is the slack reel used in the making of upholstery yarns and carpet yarns of two, three or four-ply. The operation used is the same as a plain reel following up a mule or spinning frame and is desirable where it is necessary to put a slight twist in the yarn, say, from one to ten turns to the foot in either two, three or four-ply. The number of turns to the foot is regulated by the size of the pulleys. The yarn is wound upon revolving flyers and the machine is built to make 50 skeins at a time, and the spindles are so located that the operator can see at any time when a thread breaks.

INDUSTRIAL PROGRESS. This is a new publication with its address at Milwaukee, Wis., care P. O. Box 1580. The first number which is just at hand is devoted to such subjects as the hydro-electric development of the Great Northern Power Co., Duluth, Minnesota; steam turbines used in many lines of industry; electric drive in cement mills; noteworthy installations of gas engines; increased economy in the production of steel; and machinery used in coal and coke operations. Its illustrations and its typography are of the highest class.

DOCKHAM'S JOBBING TRADE AND DEPARTMENT STORES REPORT AND DIRECTORY. This directory for 1909, has just been issued from the press, covering the United States and Canada. The lines which each jobbing house has are given in full. They are arranged alphabetically by States, cities and firms, with streets and numbers given. Published by the Dockham Publishing Company, 6 Beacon Street, Boston, Mass. Price, $1.00.

THE WHITIN MACHINE WORKS, Whitinsville, Mass. This firm has issued a very handsome calendar for 1909 with a picture of its works. It will be sent upon application to those who will write for it.

L. R. WATTLES & COMPANY, Canton Junction, Mass. We are in receipt of a calendar for 1909 from this company which is handsome enough to place upon the walls of any office.

D'OLIER ENGINEERING COMPANY, 119-21 South Eleventh Street, Philadelphia, Pa. We are in receipt of two catalogues issued by this company, one devoted to steam turbines for direct connected and belted service, and the other to horizontal centrifugal pumps both fully illustrated with the mechanical devices referred to.

MOTOR TALKS. The January number of this periodical, devoted to matters concerning display windows, is published by the Westinghouse Electric & Manufacturing Company, Pittsburg, Pa., which is well worth securing by those interested in such subjects, and it may be admitted that it is an important one, especially in the retail trade. It can be obtained, for the writing, from the publishers.

Mill News

ALABAMA.

EUFAULA. The Cowikee Cotton Mill has been incorporated with a capital of $100,000 succeeding the company known as the Eufaula Cotton Mills. It is said the company will expend $50,000 for new machinery. M. F. Cherry is one of the incorporators.

GEORGIA.

COLUMBUS. The Bibb Manufacturing Company is about to install additional machinery.

DUBLIN. The Dublin Cotton Mills have been sold to J. C. Cooper, Atlanta, for $82,000. The mills will be operated under the name of the Georgia Cotton Mills. Equipment is 8,112 spindles and 260 looms.

HAWKINSVILLE. The Southern Cotton Mills have been incorporated with a capital of $50,000 for the purpose of acquiring the Hawkinsville Cotton Mills, which has 3000 spindles and 140 looms. W. N. Parsons is one of the incorporators.

MANCHESTER. The Manchester Cotton Mills have been lately incorporated with a capital of $500,000 and have engaged Francis Walker, Atlanta, Ga., as the architect-engineer to prepare plans and specifications for a 20,000 spindle plant, which will be three stories high, 104x460 feet, as the size of the main building. The daily production is expected to be about 15,000 pounds of yarn. Fuller E. Callaway, LaGrange, can furnish information.

PALMETTO. The Palmetto Cotton Mills have been incorporated with a capital of $25,000. H. L. Johnston can furnish information.

ROME. In our last month's issue we referred to the Rome Hosiery Mills as about to erect buildings along modern construction. We now learn that these mills will install about one hundred knitting machines, thus doubling their present capacity. It is expected that nearly $30,000 will be expended.

THOMASTON. The Thomaston Cotton Mills are to build a 250-foot addition and install 5,000 spindles with complement of looms. O. A. Robbins, Charlotte, N. C., is the engineer in charge. Reference was made to this matter in our last month's issue.

LOUISIANA.

BATON ROUGE. The Board of Trade of this city is negotiating for the establishment of a knitting mill.

MASSACHUSETTS.

MILFORD. The business of the Oxford Linen Mills, which were started at North Brookfield about a year ago, has grown rapidly and plans are now in hand for the construction of half a dozen new buildings all of which will be larger than the present main mill. The buildings will be of concrete and the new power plant will be operated by electricity.

MAINE.

FOXCROFT. Mayo & Sons are building a woolen mill to be constructed of re-enforced concrete.

MICHIGAN.

EATON RAPIDS. Improvements are now under way at the Horner Bros. woolen mills at this place that will make this industry the most extensive of its kind in the State.

NEW JERSEY.

CAMDEN. The Paul Guenther Co. has been incorporated with a capital of $300,000 to manufacture hosiery, silk and other fabrics. All of the incorporators belong in Camden.

PATERSON. The Sweeney & Buser Co. has been incorporated with a capital of $25,000 to manufacture silk, cotton and wool goods. Hugh Sweeney of this place is one of the incorporators.

NORTH CAROLINA.

ASHEBORO. The Acme Hosiery Mills has been recently incorporated with a capital of $100,000, and will occupy a two-story building 60x100 feet and install 100 machines for a daily capacity of 400 dozen pairs. This was referred to in our last month's issue. O. R. Cox, J. E. Walker and others are interested.

BELMONT. A cotton yarn mill is under consideration for this place with a capacity of 3,000 spindles in which W. A. Willett, Cooleemee, N. C., is interested.

CHARLOTTE. The Highland Park Manufacturing Company has under consideration the erection of a mill for manufacturing coarse yarns from waste of the company's cotton mills. Plans and specifications are being prepared.

CHERRYVILLE. The Howell Manufacturing Company, it is stated, will double its plant this year so as to bring it up to about 5,200 spindles and 2,800 twister spindles.

CONCORD. The Odell Cotton Mills have been acquired and will be incorporated under the name of the Locke Cotton Mills Company, which has been incorporated with a capital of $625,000. The plant has 22,000 spindles and 750 looms. George W. Watts, Durham, N. C., can furnish information.

CONCORD. The Kerr Bleaching & Finishing Works at this place have awarded a contract for the construction of a plant that was destroyed by fire. The new structure will be four stories high, 60x225 feet, and will be equipped with bleaching and finishing machinery.

CLIFFSIDE. The Cliffside Mills are considering the doubling of its present equipment of 20,000 spindles and 910 looms.

GASTONIA. The Arlington Cotton Mills will add 3,000 spindles to its present plant, which now consists of 9,568 ring spindles.

HARDEN. O. D. Carpenter & Sons will add 4,000 spindles to their present plant, which consists of 6,160 spindles.

KINGS MOUNTAIN. The Cora Cotton Mills, it is stated, are contemplating the installation of 10,000 spindles, thus doubling their capacity.

LAURINBURG. J. P. McRae, president of Scotland Cotton Mill and Dickson Cotton Mill, is to organize a company to build a mill for manufacturing hosiery yarn for which purpose a company was incorporated last month. The installation will consist of 15,000 spindles.

LEXINGTON. The Dacotah Cotton Mill has been incorporated with a capital of $150,000 in which C. A. Hunt, Jr., and others are interested. Reference was made to this subject in our last month's issue; we learn, however, that the capital stock is as already stated, instead of $125,000 as given last month. A contract will soon be given for carding and spinning machinery, but building construction will not begin until next spring.

LOWELL. The Peerless Manufacturing Company, it is said, will increase its capacity from 5,000 to 10,000 ring spindles.

SALISBURY. The Vance Cotton Mills will build a one-story 40x50 foot addition for a warper-room.

SCOTLAND NECK. We referred to the Scotland Neck

Cotton Mills in our last month's issue as contemplating the erection of a new building and installing more machinery. These improvements will not be made immediately, except to build a few operatives' cottages.

SPRAY. The Carolina Cotton & Woolen Mills Company has been incorporated with a capital of $1,000,000 by B. Frank Mebane and associates.

TAYLORSVILLE. Fred H. White, of Charlotte, and Henry M. Wilson, of this place, propose organizing a $100,000 cotton mill company. Fifty thousand dollars are now available. 5,000 spindles are to be installed. Reference was made to this scheme in our last month's issue.

TRYON. The Tryon Hosiery Company is to erect a two-story, 50x200 foot, building of mill construction, costing about $15,000 in which machinery will be installed, costing about $15,000, so as to give a daily capacity of 2,000 dozen pairs of hosiery.

WORTHVILLE. The Worth Manufacturing Company is to increase its capacity by 4,160 spindles, bringing the total capacity up to over 10,000 spindles and 600 looms.

ZEBULON. The Zebulon Hosiery Mills have increased their capital from $10,000 to $18,000, the new stock to be paid in at once. It is the purpose of the company to add 50 knitting machines to its present number, which is 25. These mills will make half-hose only, all the machines will be 176-needle cylinder.

NEW HAMPSHIRE.

MANCHESTER. The cornerstone of the new mill of the Amoskeag Manufacturing Company was laid the latter part of December, the stone weighing four tons and was quarried on the site of the mill, being taken out in the course of the excavation.

NEW JERSEY.

HOHOKUS. The Spring Brook Manufacturing Company has been incorporated to manufacture, bleach, dye and finish cotton cloth. The capital is $75,000. Chas. H. Watnough, Jr., is one of the incorporators.

JERSEY CITY. The Westmoreland Manufacturing Company has been incorporated with a capital of $10,000 to manufacture woolen, worsted and cotton goods. George H. Russell is one of the incorporators.

JERSEY CITY. The Fibre Products Company has been incorporated with a capital of $150,000 to manufacture silk and other textile fabrics. H. F. Dexter is one of the incorporators.

SALEM. James Taylor has bought at auction the Salem Printing Mills for $6,000. It is stated that he intends to renew operations in the plant very soon. Mr. Taylor's address is Philadelphia.

NEW YORK.

DOLGEVILLE. The Heron Felt Novelty Company has been incorporated with a capital of $15,000 to manufacture woolen and felt goods. R. P. Heron of this place is one of the incorporators.

THERESA. The Theresa Woolen Company is erecting a power plant on the Indian River, which will develop 900 horse power or more.

UTICA. The Lynch Knitting Company has been incorporated with a capital of $7,500 to manufacture knit goods. Arthur V. Lynch is one of the incorporators.

OKLAHOMA.

OKLAHOMA CITY. Brown Corneilson is interested in a plan for erecting a cotton mill in this place.

PENNSYLVANIA.

PHILADELPHIA. The Way Muffler Company will build a five-story addition to its plant thereby greatly increasing its output, which will consist of a full line of men's underwear and bathing suits in addition to its present product of mufflers and coat sweaters.

PHILADELPHIA. The Morris Hosiery Manufacturing Company has been incorporated with a capital of $10,000.

MACUNGIE. The Macungie Silk Company has been incorporated with a capital of $10,000.

SOUTH CAROLINA.

GREENVILLE. In our last month's issue we noted that the Brandon Mills proposed to increase their capital from $450,000 to $1,000,000. We now learn that the increase will be from $450,000 to $900,000, and an additional mill will be erected, probably 125x300 feet and four stories high to accommodate 75,000 spindles and 100 looms for the production of print cloth and converters goods. Lockewood, Greene & Company, Boston, Mass., are the engineers.

LAURENS. The Watts Mill will build an addition, 256 feet long, one story high, thus increasing its present building to 900 feet. Two thousand spindles and other machinery will be installed.

UNION. The Otterray Mills have been organized with a capital of $250,000, succeeding the Aetna Cotton Mills, recently purchased by Lewis W. Parker, Greenville, S. C., and associates. The equipment is 21,000 spindles and 100 looms.

WALHALLA. The Oconee Knitting Mills will increase their capital from $50,000 to $75,000.

TENNESSEE.

BRISTOL. The Jonesville Manufacturing Company has added 25 knitting machines to its plant.

LEBANON. The Lebanon Woolen Mills has been incorporated with a capital of $60,000. H. K. Edgerton is one of the incorporators. Reference to this project was made in our last month's issue.

MADISONVILLE. Madisonville Knitting Mills have increased their plant with an addition of ten knitting machines.

TRENTON. The Trenton Cotton Mills, it is reported, will install additional machinery, which now consists of 10,000 rings and 4,000 twister spindles.

TEXAS.

CUERO. The Cuero Cotton Factory has been incorporated with a capital of $74,481. Emil Reiffert is one of the incorporators.

ENFIELD. The Enfield Hosiery Mill will add 43 knitting machines and 60 horse-power engines to its present equipment.

FORT WORTH. The Factory Club of this place is negotiating with Fred H. White and B. S. Boyd, of Charlotte, N. C., relative to the location of a $300,000 cotton mill.

WASHINGTON.

ABERDEEN. A woolen mill will probably be located at this place by E. A. Lever, of California. The citizens of Aberdeen promise to subscribe for stock, and if enough can be disposed of, it is said the mill is assured.

WEST VIRGINIA.

KEYSER. The Patchett Worsted Company intends to increase its capital from $100,000 to $200,000. The plant now consists of 2,500 worsted spindles, dyeing equipment, etc.

AMONG SUPERINTENDENTS, OVERSEERS AND OTHERS

We shall be pleased to receive notices of any changes among agents, superintendents, and overseers in textile mills.

W. A. Duke has accepted a position as overseer of carding and combing in the Wampum Cotton Mills, Lincolnton, N. C.

C. H. Boyd has become overseer of carding and combing in the cotton mill at Mayesworth, N. C.

J. E. Yon has accepted a position as overseer of spinning in the Majestic Mills at Belmont, N. C.

Charles F. Faulkner is now superintendent of the Eufaula Cotton Mills, Eufaula, Ala.

J. A. Campbell is now in charge of spinning room No. 2, of the Anderson Cotton Mills, Anderson, S. C.

T. S. Haskell is now in charge of the carding and spinning in the Eastman Cotton Mills, Eastman, Ga.

R. H. Lewis has been made general manager of the Oxford Cotton Mills, Oxford, N. C.

W. B. Morgan is now overseer of weaving at the Manetta Mills, Lando, S. C.

Seth Taylor has taken a position as overseer of finishing in the Riverside Cotton Mills, Danville, Va.

L. A. Carter has been chosen superintendent and manager of the Hillsboro Cotton Mills, Hillsboro, Texas.

R. R. Blakely is now in charge of the cloth room for the Victor Manufacturing Company, Greer, S. C.

D. M. Myers has accepted the superintendency of the John Manufacturing Company, Kings Mountain, N. C.

H. J. Forsyth is now overseer of weaving at the Hamilton-Carhartt Mills, Rock Hill, S. C.

A. L. Agner is now overseer of weaving, slashing, drawing-in and cloth rooms of the Nokomis Cotton Mills, Lexington, N. C.

D. Little has been promoted to the superintendency of the Gaffney Manufacturing Company, Gaffney, S. C.

Robert Moring has taken the superintendency of the Swift Cotton Mills, Elberton, Ga.

W. N. Wilson is now in full charge of the Avon Mills, Gastonia, N. C.

John Smith has been promoted to the position of overseer of spinning at the Avon Mills, Gastonia, N. C.

S. H. Howard has taken the superintendency of the Holt-Williamson Mill, Fayetteville, N. C.

R. G. Armfield is now overseer of carding at the Holt-Williamson Manufacturing Company, Fayetteville, N. C.

R. T. Comer is now superintendent and manager of the Cuero Cotton Mills, Cuero, Texas.

D. J. Bolton is now superintendent of mill No. 2, Marlboro Cotton Mills, McColl, S. C.

Harry C. Dresser has taken a position as superintendent of the Cheswell Cotton Mill Company, Westminster, S. C.

H. E. Erwin is now in charge of the spinning at the Springstein Mills, Chester, S. C.

J. H. Huff is now overseer of spinning for the Gaffney Manufacturing Company, Gaffney, S. C.

D. W. Andrews is now overseer of carding for the Orangeburg Cotton Mills, Orangeburg, S. C.

C. V. James is now overseer of carding for the W. R. Kindly Cotton Mills, Mount Pleasant, N. C.

C. N. Poore has taken charge of the new Green River Manufacturing Company at Zirconia, near Hendersonville, N. C.

I. B. Covington is now general superintendent of the Mount Holly Cotton Mill and the Albion Mill Company, Mount Holly, N. C.

UNEMPLOYED IN GREAT BRITAIN.

The management committee of the General Federation of Trade Unions in Great Britain has issued a manifesto in which all trade unions are advised to instruct their members to refuse to work overtime. The manifestto says:

Board of trade statistics, trade-union returns, and processions of the workless alike testify to the fact of unemployment and to the grave nature of the situation. Engineering trade unions, with a membership of 153,363, report an unemployed percentage of 12, while shipbuilding unions, with a membership of 60,631, have 25.2 per cent. of their members out of work. Other trades show equally deplorable returns, which suggest that the average percentage of totally or partially unemployed among skilled workers is little short of 10 per cent.

It is asserted by the management committee that over 7,000,000 human beings in Great Britain are enduring hardship and want through unemployment, and this estimate is based on the following calculation:

There are 5,000,000 skilled workers in Great Britain, of whom 10 per cent, are totally or partially unemployed. For every skilled workman out of employment two unskilled men are workless. Every worker represents a family of five. Skilled workers unemployed, 500,000; unskilled, 1,000,000; their families, 6,000,000; total, 7,500,000.

In the hope of mitigating the evils of these depressions we recommend that all public bodies supervise their own direct and indirect employment; that they stipulate in their contracts for the total abolition of overtime, and distribute their work so as to meet the periods of depression and the worst conditions of unemployment. We also advise trade unions to issue executive instructions to their members to refuse to work overtime. We urge the immediate employment of surplus labor by the reclamation of waste lands, the provision of additional recreation grounds, the protection of foreshores and riversides from the encroachment of sea or stream, the development of harbor facilities, afforestation, the acquirement of land, and the building or rebuilding of houses for the workers on improved sanitary principles; the encouragement of municipal and co-operative farms, the systematic co-ordination of municipal and governmental regulations and machinery for unemployed, the acquisition by the State of the canal and railway systems throughout the United Kingdom, and the full development of the small-holdings act, with the State as proprietor.

It is also recommended that a national department of labor be established, presided over by a minister with a seat in the cabinet, charged with the direction of that labor which has not been absorbed in the ordinary course, and that a permanent unemployed board be set up.

The quick changes in the structure of cloth from that of closely woven to the most open weave is often the cause of special effects in the design, the chief of which is the contortion usually termed mock leno or lace effect.